Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In the Matter of	)	
Distribution of the	)	**Docket No. 14-CRB-0010-CD (2010-13)**
2010, 2011, 2012, and 2013 Cable Royalty Funds	)	

ERRATA TO WRITTEN REBUTTAL STATEMENT REGARDING ALLOCATION METHODOLOGIES OF PROGRAM SUPPLIERS

On September 15, 2017, the Motion Picture Association of America, Inc. ("MPAA"), its member companies and other producers and/or syndicators of syndicated movies, series, specials, and non-team sports broadcast by television stations ("Program Suppliers"),[1] submitted their Written Rebuttal Statement Regarding Allocation Methodologies ("WRS-A") in the captioned docket. Thereafter, in the course of preparing responses to discovery requests, Program Suppliers' witness Jeffrey S. Gray, Ph.D. discovered an error in Table 11 (appearing on page 27) of his rebuttal testimony. Accordingly, Program Suppliers are submitting this Errata to correct Dr. Gray's rebuttal testimony. Exhibit A hereto is a clean copy of Dr. Gray's corrected rebuttal testimony. Exhibit B hereto provides a redline copy of Dr. Gray's rebuttal testimony identifying the corrections Dr. Gray made with specificity.

ORIGINAL

[1] A listing of MPAA-represented Program Suppliers who submitted royalty claims for the 2010-13 cable royalty years was included as a part of MPAA's January 21, 2015 and July 6, 2015 Petitions to Participate filed in connection with this consolidated proceeding.

Respectfully submitted,

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Dated: November 3, 2017

CERTIFICATE OF SERVICE

I hereby certify that on this 3rd day of November, 2017, a copy of the foregoing pleading was provided to each of the parties on the attached service list, either electronically via the Copyright Royalty Judges' eCRB electronic filing system for those parties receiving service through eCRB, or by Federal Express overnight mail.

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EXHIBIT A

Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In re	
DISTRIBUTION OF CABLE ROYALTY FUNDS	DOCKET NO. 14-CRB-0010-CD (2010-13)

REBUTTAL TESTIMONY OF JEFFREY S. GRAY, PH.D.

September 15, 2017

Corrected November 3, 2017

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I. INTRODUCTION

1. I, Jeffrey Gray, am an economist and President of Analytics Research Group, LLC. I provided initial testimony in this proceeding, which was filed on December 22, 2016 ("Gray WDT"), amended on March 9, 2017, and corrected on April 3, 2017. A description of my background and experience, as well as a copy of my *curriculum vitae*, was included with that testimony.

2. I understand that the purpose of this proceeding is to allocate the 2010, 2011, 2012, and 2013 cable royalty funds ("2010-2013 Cable Royalties"), paid by Cable System Operators ("CSOs") under statutory licenses established by Section 111 of the Copyright Act ("Section 111"), among broad self-organized claimant group categories.[1] In my initial testimony, I provided what I believe to be a sound, reliable methodology to estimate what the relative market value of distantly retransmitted programming would be in an unregulated market. I performed calculations to determine this relative market value on a *program-by-program* basis, and then summed these individual relative market values to determine the relative market value of programming by each agreed-upon program category.[2]

3. I have been asked by the Program Suppliers claimant group to respond to the amended and corrected written direct testimonies of Drs. Gregory S. Crawford, Mark A. Israel, Lisa M. George, and Christopher J. Bennett.

4. Drs. Crawford and Bennett provided testimony on behalf of the Commercial Television Claimants ("CTV"); Dr. Israel, on behalf of the Joint Sports Claimants ("JSC"); and Dr. George, on behalf of the Canadian Claimants Group ("CCG");

[1] Historically, for cable Phase I Proceedings there have been eight broad categories of programming: (1) Program Suppliers; (2) Joint Sports Claimants ("JSC"); (3) Commercial Television Claimants ("Commercial Television""); (4) Public Television Claimants ("Public Television"); (5) Devotional Claimants ("Devotionals"); (6) Canadian Claimants Group ("Canadian Claimants"); (7) Music Claimants; and (8) National Public Radio ("NPR"). The Judges adopted these eight categories of programming for this proceeding as well. *See* Notice of Participant Groups, Commencement of Voluntary Negotiation Period (Allocation), and Scheduling at Exhibit A (November 25, 2015) ("Notice").

[2] Gray WDT.

describing alternative distribution methodologies with correspondingly alternative proposed royalty share allocations.[3]

5. I understand that the Program Suppliers have asked Dr. Joel Steckel and Mr. Howard Horowitz to respond to the written direct testimony of Mr. James M. Trautman, who has submitted results from a survey of CSOs, the "Bortz Survey,"[4] to assess the relative market value of programming at issue in this proceeding. I also provide my opinion on the usefulness of surveying CSOs in this context, as well as the relative usefulness of the Bortz Survey results and the survey results from an alternative survey overseen by Mr. Horowitz. Finally, my testimony includes comments on the written direct testimony of Dr. Erkan Erdem, who provided testimony on behalf of the Settling Devotional Claimants ("Devotionals").[5]

6. My testimony is based upon information currently available to me. I reserve the right to supplement this testimony should additional information be made available.

II. SUMMARY OF OPINIONS

7. For the reasons set out below, my conclusions regarding calculating the relative market value of programming described and reported in my initial testimony are unaltered by written direct testimony submitted on behalf of CCG, CTV, JSC, or the Devotionals.

8. Necessary modifications made to the regression models proposed by opposing parties' experts to reflect the regulated structure of 2010-2013 royalty payments made by

[3] Testimony of Gregory S. Crawford, PhD, Corrected April 11, 2017 ("Corrected Crawford WDT"); Testimony of Christopher J. Bennett PhD, Corrected April 11, 2017; Written Direct Statement of Lisa M. George PhD, Corrected May 17, 2017 ("George WDT"); Written Direct Testimony of Dr. Mark A. Israel, December 22, 2016 ("Israel WDT"); Written Direct Testimony Michelle Connolly, Ph.D., December 22, 2016.

[4] *See In the Matter of Distribution of the 2010, 2011, 2012, and 2013 Cable Royalty Funds*, Written Direct Testimony of James M. Trautman (Dec. 22, 2016), *attachment*: Bortz Media & Sports Group, Inc., Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-2013 (Dec. 22, 2016).

[5] Testimony of Erkan Erdem, Ph.D., March 9, 2017 ("Erdem WDT").

CSOs demonstrate that the regression results do not support the Bortz Survey results, and therefore do not support the royalty allocations suggested by the Bortz Survey.

9. Dr. Israel's analysis of large cable system's programming expenditures and Dr. Crawford's comments on the importance of programming heterogeneity are not relevant to CSO's carriage choices concerning distant signals and should not be considered in how to distribute royalties paid by CSOs to copyright owners.

10. Neither the Bortz Survey nor the Horowitz Survey provides a reasonable basis for measuring marketplace value. However, the Horowitz Survey is superior to the Bortz Survey as it corrects for some of the Bortz Survey's major flaws.

III. REGULATED FEES REGRESSION ANALYSES

11. Drs. Crawford and Israel used multiple regression analyses to calculate royalty shares for each claimant category for 2010-2013. Dr. George used multiple regression analyses to calculate royalty shares only for the CCG claimant category for 2010-2013. Multiple regression analysis calculates the individual influences that each of a set of independent (or explanatory) variables has on a specific variable chosen to study. The variable chosen to study is known as the dependent (or outcome) variable.

12. Table 1 below presents a summary of Drs. Crawford's, Israel's and George's regression methodologies and the data they relied upon to calculate their recommended royalty share allocations. In each of their regression models, the outcome variable is some form of the regulated royalty fees paid by CSOs. As detailed in Appendix A, the explanatory variables differ among the models, but both Dr. Crawford and Dr. Israel's regression models included total minutes of programming, or program volume, by each claimant category; whereas, Dr. George's explanatory variables included CCG programming minutes, JSC programming minutes, and Program Suppliers/Devotionals programming minutes, where Program Suppliers/Devotionals minutes is the sum of Devotional program minutes and Program Suppliers minutes. Because each multiple

regression model analyzes how a set of explanatory variables influences a regulated royalty fees, I refer to these three models as "regulated fees regressions."

Table 1: Summary of Regulated Fees Regressions

Claimant Group's Expert	*Crawford* CTV	*Israel* JSC	*George* CCG
Outcome Variable Analyzed	Natural Logarithm of Royalty Fees Paid	Royalty Fees Paid	Royalty Fees Paid
Number of Explanatory Variables in Final Model[xx]	22	20	24
Data: Form 3 CSO Royalty Fees Analyzed	All CSOs in U.S.	Sample of CSOs in U.S.	Sample of CSOs with retransmissions in "Canadian Region" in U.S.[xxi]
Number of Observations in Final Model	26,126	5,465	2,198
Calculated Royalty Shares	All Claimant Groups	All Claimant Groups	CCG Claimants

[xx] A list of the explanatory variables in the three final models is included in Appendix A.
[xxi] See George WDT, p. 51 for definition of Canadian Region.

13. The regulated fees regressions attempt to estimate how an additional minute of retransmitted programming, by claimant category, impacted the royalty fees paid by CSOs. None of the three regulated fees regressions estimate how prices would be determined, or even influenced by factors in a free, unregulated, market. Royalty fees paid by CSOs under Section 111 are set by statute and determined by the CSO's number and type of distant signal equivalents and gross receipts. They are not determined by the number of minutes of programming, or minutes by program category type, carried on the retransmitted signals.

14. CSO royalty payments are set by a *compulsory* license and Drs. Crawford, Israel, and George offer no evidence that such payments have any bearing on a CSO's willingness to pay for retransmitted signals. For example, CSOs with subscribers who place *no* value on the programming carried on retransmitted signals are still required to pay a mandated minimum royalty fee. In such circumstances, a regression analysis that

examines the relationship between the type of programming on those signals and the mandated CSO royalty fees paid, by construction, would generate non-probative (and potentially nonsensical) insights into the relative market value of programming carried on distantly retransmitted signals.

15. CSOs' mandatory minimum royalty fees requirement is not a theoretical curiosity. Actual choices made by CSOs concerning which, if any, broadcast signals to retransmit from 2010 through 2013 demonstrated that CSOs' regulated royalty payments often provided no information regarding how much CSOs may have valued their distantly retransmitted signals over those royalty years. Consequently, there is no economic justification to estimate their relative market value based on the regulated fees paid by all CSOs.

16. Each royalty year there are two accounting periods at the end of which CSOs are required to file Statements of Account ("SOAs") with the Licensing Division of the Copyright Office. These SOAs include information on the CSOs' gross receipts, which signals they distantly retransmitted, and the statutorily set royalty fees due as result of these retransmissions. In the 2010 to 2013 cable royalty years, CSOs could report royalties at the subscriber group level, defined as sets of communities that receive the same portfolio of distant broadcast signals.[6]

17. Each accounting period from 2010-2013, there averaged 1,004 Form 3 CSOs that paid royalties ostensibly giving the CSOs the right to retransmit stations on a distant basis. However, of these 1,004 CSOs, 527 chose to retransmit the exact or fewer number of signals than their regulated minimum fee allowed. Thus, these 527 CSOs' decisions did not impact their costs and their retransmission choices, and did not provide information regarding their willingness to pay for the right to retransmit the signals they chose. During the 2010-2013 period, 83 CSOs, on average, despite paying the regulated

[6] This resulted from the enactment of Satellite Television Extension and Localism Act of 2010.

minimum fee allowing them to distantly retransmit signals, chose not to retransmit any signals at all during each accounting period.

18. To the extent one wishes to rely on the statutorily-determined CSO payments at all, it is only when a CSO retransmitted more signals and/or type of signals than its regulated required minimum fee allowed that there may be some information in the royalty fees paid. The reason is that only in those cases did the CSO's decision incur an incremental cost to the CSO's regulatory set minimum fee requirement. While the increased regulatory cost for these CSOs was also set by statute, the incremental cost incurred does suggest an increased willingness to pay for the distantly retransmitted programming. This situation, where CSOs' retransmission choices incurred a royalty fee greater than their statutorily set minimum, occurred for 477 CSOs, on average, each accounting period, or 48% of all CSOs over the 2010-2013 royalty years.

19. As described in detail below, restricting Drs. Crawford's, Israel's, and George's regression analyses to those CSO choices where there may be some information regarding CSOs' willingness to pay for retransmissions has a significant impact on their findings, and therefore their recommended royalty allocations.

A. Crawford's Regulated Fees Regression

20. Dr. Crawford's regulated fees regression examined the relationship between the natural log of the royalty fees and the minutes of programming of the claimant categories carried on distant broadcast signals *within* a given subscriber group and accounting period. He included in his regression model other explanatory variables he believes might impact the royalty fees paid by CSOs.[7] By performing calculations within subscriber groups, Dr. Crawford attempted to measure how a CSO's selection of stations to retransmit to its subscriber groups impacted its calculated royalty fees attributed to that subgroup in the SOA. According to this logic, the greater the calculated royalty fees

[7] *See* Corrected Crawford WDT, Section VI.B. for a detailed discussion of his regression model. A list of explanatory variables in Dr. Crawford's model is included in Appendix A in this testimony.

based on stations retransmitted to subscriber groups, the greater the value of the station to the CSO. However, this logic fails when these calculated royalty fees do not exceed the CSO's required minimum fees.

21. Table 2 below presents an example of a CSO, whose calculated royalty fees were less than its required minimum fees, demonstrating the flaw in Dr. Crawford's logic and therefore his regulated fees regression methodology. In the second accounting period of 2010, Time Warner Cable NYC, a CSO in Bethel NY (CSO ID #NYN560), had gross receipts of $12,312,524 with an associated regulated minimum royalty fees requirement of $131,005. However, the final column reports that calculated royalty fees at the subscriber group level totaled only $93,152, or $37,854 *less than* the CSO's minimum fee requirement. Thus, the CSO could have retransmitted additional signals distantly and/or redistributed the stations it did retransmit across subscriber groups at no additional cost. This means that calculated subscriber group royalty fees reported in the final column do not measure, or provide any information regarding, the extent to which this CSO valued the signals it distantly retransmitted.

Table 2: Example of a CSO's calculated royalty fees being lower than the required minimum (and paid) royalties of $131,005. CSO ID #NYN560, Accounting Period 2010/2.

Subscriber Group	*Gross Receipts*	*# Distant Stations*	*Calculated Royalty Fees*
1	4,609,922	0	0
2	586,710	3	4,682
3	1,031,164	0	0
4	286,048	3	2,283
5	266,536	3	2,127
6	628,591	4	6,688
7	305,754	3	2,440
8	5,974	17	312
9	187,201	4	1,992
10	26,807	4	465
11	63,926	5	1,279
12	35,132	5	435
13	1,553,698	3	12,399
14	381,756	4	4,062
15	1,305,301	4	22,654
16	108,209	3	864
17	42,103	16	6,383
18	494,166	4	5,258
19	229,916	3	1,835
20	147,851	15	16,869
21	15,758	3	126
CSO TOTAL	**$ 12,312,524**	**106**	**$ 93,152**

22. Yet the Crawford regulated fees regressions relied upon these calculated subscriber group royalty fees to estimate the relative market value to CSOs of programming on distantly retransmitted signals. When these fees are not a binding, or incremental cost, the data simply do not inform the extent to which the CSO might be willing to pay to retransmit individual stations. With these royalty fees data, it is not possible to gauge the value of programming carried on those retransmitted stations to the CSO. Dr. Crawford's proposed royalty share allocations are therefore unreliable.

23. However, as I described earlier in paragraph 15 above, approximately half of CSOs chose to distantly retransmit a quantity and type of broadcast signals that caused their royalty fees paid to be greater than their statutorily mandated minimum fees over

2010-2013. For these CSOs, changing which or how many broadcast stations they retransmitted to each of their subscriber groups did impact the CSOs' costs. Applying Dr. Crawford's regulated fees regression analysis to this subset of CSOs could provide some information regarding the relative market value of the programming category types carried on the retransmitted signals. I do so in Table 3 below.

24. Column 1 in Table 3 below presents the average royalty shares over 2010-2013 based upon my attempted replication of Dr. Crawford's described regulated fees methodology to all CSOs. Column 2 presents each claimant category's calculated royalty shares applying Dr. Crawford's regulated fees regression methodology to the subset of CSOs who paid more than the minimum royalty fees, where adding or dropping retransmitted stations to subscriber groups would impact the CSOs' royalty fees paid, or cost. Column 3 shows my recommended allocation of 2010-2013 royalties which I present in my direct testimony.

Table 3: Impact of accounting for minimum fees requirement on Crawford royalty shares, 2010 – 2013

Claimant Category	*(1) Crawford Royalty Shares*	*(2) Crawford-Modified Royalty Shares*	*(3) Distant Viewing Royalty Shares*
CCG	3.51%	5.46%	3.70%
CTV	16.50%	13.54%	13.50%
Devotionals	0.60%	0.75%	1.44%
Program Suppliers	23.44%	61.19%	45.43%
PTV	17.72%	19.06%	33.04%
JSC	38.23%	0.00%	2.89%

25. Table 3 shows that while CTV's calculated royalty share drops from 16.50% to 13.54% when applying Dr. Crawford's model to the subset of relevant CSOs, the most dramatic changes occur with the Program Suppliers and JSC categories. While JSC's average royalty shares drops 38.23 percentage points to a zero share, Program Suppliers' royalty share increases by 37.75 percentage points to 61.19%.

26. While applying Dr. Crawford's regulated fees model to the subset of relevant CSOs provides a more reliable measure of royalty shares, the model and estimated shares continue to be flawed as they (1) remain based on regulated prices; and (2) are ultimately a volume-based measure. The regulated fees regression does not measure the relative market value of individual programming carried on the retransmitted stations, and thus it cannot provide a reliable measure of the relative market value of aggregated individual programming. That is, the model does not measure which programs, or aggregated groups of programs, are valued by the CSO and its subscribers. In contrast, the distant viewing-based methodology I proposed in my written direct testimony does.

27. Column 3 in Table 3 reports the calculated royalty shares by programming category based on the analysis described in my initial testimony. These viewing-based and modified-Crawford royalty shares are similar in that the ranking order of the top four royalty shares are the same. Remarkably, the modified-Crawford's model suggests royalty shares approximately 16 percentage points higher for Program Suppliers and approximately 14 percentage points lower for PTV over the 2010-2013 royalty years.

B. Israel's Regulated Fees Regression

1. Statistical Imprecision of Israel's Estimates

28. In his written direct testimony, SDC expert Dr. Erdem criticized Dr. Israel's regulated fees model due to the remarkable sensitivity of its regression estimates to Dr. Israel's choice of which explanatory variables to include. (Erdem WDT, pp. 14-17 and Erdem Exhibits 12-13). Dr. Erdem found that Dr. Israel's implied JSC royalty shares could range from 0% to 63.29% by changing assumptions regarding the choice of explanatory variables or the assumed functional relationship those variables have on royalty fees paid. I agree with Dr. Erdem's implication that Dr. Israel's regulated fee model is unreliable due to the statistical imprecision of his regression estimates.

29. With respect to the statistical imprecision of Dr. Israel's estimates, I have been able to replicate Dr. Israel's results exactly and calculated 95% confidence intervals

around his estimates of the value of an additional minute of programming by claimant category type. I found that Dr. Israel's estimate for the JSC category of $4.836 per additional minute, as reported in Israel Table V-2 (Israel WDT p. 20), has a 95% confidence interval of $0.0014 to $9.671. Dr. Israel's calculated values of an additional minute of programming by claimant category lead directly to his calculated royalty shares. Using the lower bound of the wide, or imprecise, 95% confidence interval results in Dr. Israel's proposed royalty share for JSC to be 0.05%. This royalty share is close to the 0% JSC royalty share Dr. Erdem found in one of his modifications of Dr. Israel's regression model (Erdem Exhibit 13, Model 1A) as well as the 0% share calculated by the modified Crawford model presented in Table 3 above.[8] The imprecision in Dr. Israel's own reported estimates underscores the lack of reliability of Dr. Israel's regulated fees model.

2. Impact of Minimum Fees Requirement on Israel Estimates

30. Dr. Israel's regulated fees regressions examined the relationship between royalty fees paid by CSOs and the minutes of programming by claimant categories carried on the retransmitted signals. As did Dr. Crawford, Dr. Israel included in his regression model other explanatory variables he believed might impact the royalty fees paid by CSOs.[9] However, while Dr. Crawford examined the relationship between the logarithm of regulated fees paid and his set of explanatory variables, Dr. Israel assumes a linear relationship. I agree with Dr. Crawford that studying the natural logarithm of royalties is based on "a more realistic economic assumption for the functional form of the relationship between minutes and royalties" (Crawford par. 114, p. 32). Specifically, examining the natural logarithm of regulated fees paid allows for a non-linear relationship with the explanatory variables used. Using the natural logarithm calculates

[8] The 0% share calculated by Dr. Erdem is due to the wide confidence interval Dr. Erdem calculated in his modified Israel regression model, Model 1A. Dr. Erdem concluded because the 95% confidence interval includes zero, we cannot reject that the relative value of JSC programming is zero.

[9] See Israel WDT, pp. 12-24 for a detailed discussion of his regression model. A list of explanatory variables in Dr. Israel's model is included in Appendix A in this testimony.

the percentage impact retransmitted minutes have on royalties. In addition to being more realistic from an economic perspective, a statistical test suggests that a non-linear, or percentage-based assumption, fits Dr. Israel's data better than does his assumed linear relationship.[10]

31. Table 4 below presents Dr. Israel's royalty shares as well as those resulting from a logarithmic transformation of regulated royalty fees, applied to the subset of CSOs where the regulated fees paid were greater than the minimum amount required by statute. The final column reports the calculated royalty shares by programming category based on the distant viewing analysis described in my initial testimony.

Table 4: Impact of accounting for minimum fees requirement on Israel royalty shares, 2010-2013[11]

Claimant Category	*(1) Israel Royalty Shares*	*(2) Israel-Modified Royalty Shares*	*(3) Distant Viewing Royalty Shares*
CCG	0.00%	4.15%	3.70%
CTV	22.16%	27.20%	13.50%
Devotionals	0.00%	0.64%	1.44%
Program Suppliers	26.82%	44.27%	45.43%
PTV	13.48%	19.55%	33.04%
JSC	37.54%	4.19%	2.89%

32. As occurred when applying Dr. Crawford's model to the subset of relevant CSOs whose retransmissions decisions impacted their costs, the most dramatic changes occur with the Program Suppliers and JSC categories. JSC's average royalty shares drops 33.35 percentage points to a 4.19% share, and Program Suppliers' royalty share increases 17.45 percentage points to 44.27%. As seen in the final column, the Israel-modified royalty shares for Program Suppliers is similar to the 45.43% average share calculated based on relative distant viewing shares.

[10] A Box-Cox functional form test suggests a log-linear model is a preferred specification over a simple linear model.

[11] Dr. Israel's regression analysis was only performed for the 2010-12 royalty years, and does not include 2013.

C. George's Regulated Fees Regression

33. Dr. George's regulated fees regression examined the relationship between royalty fees paid by CSOs and programming minutes and other explanatory variables listed in Appendix A. Her rationale for the explanatory variables in her regression fees model is to maintain "consistency and comparability with prior proceedings."[12] Dr. George restricts her regulated fees regression to the "Canadian Region" and only presents an estimate of the relative market value of programming for the CCG category. Dr. George defines the Canadian Region as the portion of the northern United States in which CSOs were permitted to retransmit Canadian signals under the compulsory licenses between 2010 and 2013.[13]

34. I have replicated Dr. George's regression results exactly. Her regression model would imply a CCG royalty share in the Canadian region of 22.05%. In her Table 1a, Dr. George reported that royalties in the Canadian Region totaled $217,015,916. Thus, according to Dr. George, the value of CCG programming in the Canadian Region equates to 22.05% * $217,015,916, or $47,852,682. Total royalties were $774,854,063 over 2010-2013. Dr. George therefore concluded that CCG retransmitted programming warrants $47,852,682/ $774,854,063, or 6.18%, of all royalties paid over 2010-2013.

35. Even though Program Suppliers and Devotional programming belong to different agreed-upon claimant categories, Dr. George combines them into a single category for her regulated fees regression analysis. Her regression found that each additional 1,000 minutes of Program Suppliers/Devotional programming on distantly retransmitted Canadian Signals was associated with a $294 reduction in royalty fees paid. Dr. George then proceeded to calculate that Program Suppliers/Devotional's royalty share from these signals in the Canadian region was *negative* 12.35% (George WDT, Table 3). When

[12] George WDT, p. 23. She stated that she made minor adjustments to reflect changes in the cable market since the prior proceeding.

[13] As described in her written direct testimony, her definition of the Canadian Region includes areas outside the Canadian Zone where Canadian signals may be retransmitted to include CSOs that moved, at least partially, into the Canadian Zone through merger activity during 2010-2013. George WDT, p. 21.

calculating her CCG royalty share, Dr. George does not adjust her calculation to include only those categories with estimated positive marginal values of programming. That is, rather than treat Program Suppliers/Devotional programming on retransmitted Canadian signals as having no value; she calculated that such programming had *negative* value to CSOs and their subscribers. As a result, her proposed methodology suggested that the Program Suppliers and Devotional claimant categories should *make additional payments* of $26,801,466 (12.35% * $217,015,916) into the Canadian Region pool to benefit CCG.

36. Adjusting the George methodology such that the Program Suppliers and the Devotional programming on Canadian signals had zero value to CSOs, rather than penalize those copyright owners for having their programming retransmitted, would imply a 5.50% share for CCG of the overall royalty pool.

37. Aside from its suggestion that Program Suppliers and Devotional claimants contribute additional funds to the royalty pool to benefit CCG claimants, Dr. George's regulated fees regression suffers from similar flaws as do Dr. Crawford's and Dr. Israel's regulated fees regressions. Dr. George does not restrict her regression to analyze the CSO retransmission choices to those choices that were associated with incremental costs. When applying Dr. George's regulated fees model to the subset of CSOs where the regulated fees paid were greater than the minimum amount required by statute, there is not a statistically significant relationship between CCG programming minutes and royalty fees paid in the Canadian region.[14] Thus, one conclusion based on Dr. George's methodology, applied to relevant CSOs, is that CCG's royalty share in the Canadian Region, as well as the entire United States, is 0%. However, because cable subscribers viewed retransmitted CCG programming on a distant basis, I believe there is economic value to the programming. A more reasonable measure of CCG's royalty share corresponds to its programming's share of distant viewing, or 3.70%, on average over the 2010-2013 royalty years.

[14] *See* Appendix D for regression results applying Dr. George's model to the subset of CSOs paying greater than their statutorily set minimum.

D. The Issue of WGN and Non-Compensable Programming

38. As stated in my direct testimony, I excluded from my analysis of the relative market value of distantly retransmitted programming all programs that aired on WGN's local feed ("WGN") that were not simultaneously broadcast on WGN's national feed ("WGNA") because only simultaneously retransmitted programming is compensable under Section 111. I then proceeded to perform an analysis of the relative market value of each compensable program aired on retransmitted stations, then added up the values of the individual programs into the agreed upon program categories.

39. Dr. Bennett provided an example of compensable as opposed to non-compensable WGN programming. In Bennett Figure 5, reproduced below, only "WGN News at Nine" that aired on WGN and WGNA during the same time slot on January 2, 2010 is defined as compensable. Each other program in Dr. Bennett's example, all Program Suppliers programming, are defined as non-compensable under Section 111.

Bennett Figure 5. Snapshot of WGN and WGNA airings data

Time (UTC)	WGNA		WGN	
	Program title	Program runtime	Program title	Program runtime
02:00:00	Barney Miller	30 min	Smallville	60 min
02:30:00	Barney Miller	30 min		
03:00:00	WGN News at Nine	60 min	WGN News at Nine	60 min
04:00:00	Scrubs	30 min	Family Guy	30 min
04:30:00	Scrubs	30 min	Two And A Half Men	30 min

40. Dr. Bennett's example is emblematic of the overall WGN/WGNA non-compensable retransmissions issue. As shown in Table 6 below, approximately 45.9% of all retransmitted minutes from 2010-2013 were non-compensable WGN minutes (42.8% of non-compensable Program Suppliers programming and 3.1% of non-compensable the Devotionals programming). Thus, 93.3% of all retransmitted non-compensable minutes that aired on WGN belong to the Program Suppliers category.

Table 6: Number and Percentage of Retransmitted Minutes by Program Category and Whether Non-Compensable WGN Programming, 2010-2013		
Category	*Retransmitted Minutes*	*% of Total*
PS	**178,597,872**	**60.0%**
Compensable PS	*51,261,616*	*17.2%*
Non-compensable WGN, PS	*127,336,256*	*42.8%*
JSC	**6,962,722**	**2.3%**
Commercial	**19,677,607**	**6.6%**
PTV	**18,322,702**	**6.2%**
Devotional	**13,585,045**	**4.6%**
Compensable Devotional	*4,384,240*	*1.5%*
Non-compensable WGN, Devotional	*9,200,805*	*3.1%*
CCG	**4,839,825**	**1.6%**
Total	**297,631,629**	**100.0%**

41. CSOs, through their subscribers, placed value on *all* programming contained on WGN that were retransmitted – both compensable and non-compensable – insofar as the subscribers viewed the programming on a distant basis. There is no evidence that CSOs discounted the value of WGN at the time they chose to carry the signal because of non-compensable programs. Table 6 above implies that 71.3% of Program Suppliers minutes that were retransmitted (127.3 million/178.6 million) aired on WGN, and are classified as non-compensable retransmissions under Section 111. The vast majority of non-compensable Program Suppliers retransmissions occurred when WGN and WGNA each aired Program Suppliers programming, but aired different titled programs, or different episodes of the same titled program. I understand that this practice of substituting programs was followed by WGN/WGNA for approximately 20 years as part of an effort to make the signal "syndex-proof" by airing programing that would not have to be blacked out due to FCC's exclusivity rules.[15]

[15] *See* Written Direct Testimony Of Richard V. Ducey, Docket No. 2007-3 CRB CD 2004-2005, p.6 (June 1, 2009).

42. The magnitude of non-compensable WGN programming is an issue for regression models that calculate the relative market value of programming based on the royalties paid by CSOs. While 45.9% of all retransmitted minutes were non-compensable WGN programming minutes, Table 7 below reports that approximately three quarters of all regulated royalty fees paid over 2010-2013 were ascribable to WGN retransmissions.

Table 7: Royalty Fees Paid Related to WGN Retransmissions and Overall					
	2010	2011	2012	2013	Total
WGN-DT	122,887,635	131,624,142	138,360,810	146,992,072	539,864,660
All	166,417,620	178,222,399	183,586,451	189,052,747	717,279,217
WGN's % of Total	74%	74%	75%	78%	75%

43. Table 7 cannot be construed as evidence of the value of WGN. Instead, it amplifies the absurdity of trying to accord any significance to WGN based on the royalty fees it purportedly generated. Also, past decision makers have questioned reliance on the "fees-generated" calculation approach both in terms of its efficacy and competing computational approaches.[16] Nevertheless, the importance of WGN's non-compensable programming to estimating the relative market value of programming can be illustrated by a hypothetical regulated market where all retransmitted programming airing on WGN and WGNA were deemed compensable, whether simultaneously retransmitted or not. I re-estimated Dr. Israel's original model, with only one change: I included WGN non-compensable programming when calculating royalty shares. This follows the reasoning that subscribers, and therefore their CSOs, value and consume programming without regard to its compensability under Section 111. These results are reported in Column 2 of Table 8 below. For ease of reference, I report again Dr. Israel's original royalty share calculations and those from my original viewing-based analysis in the adjacent columns.

[16] *See Distribution of the 2000-2003 Cable Royalty Funds*, 75 Fed. Reg. 26798, 26802-05 (May 12, 2010); *Distribution of the 2004-2005 Cable Royalty Funds*, 75 Fed. Reg. at 57063, 57071-73 (September 17, 2015).

Table 8: Israel Royalty Shares Revisited – the Impact of Non-Compensable Programming, Using Israel's Data			
Claimant Category	*(1) Israel Royalty Shares*	*(2) Israel Royalty Shares Including N-C Minutes*	*(3) Distant Viewing Royalty Shares*
CCG	0.00%	0.00%	3.70%
CTV	22.16%	13.30%	13.50%
Devotionals	0.00%	0.00%	1.44%
Program Suppliers	26.82%	56.08%	45.43%
PTV	13.48%	8.09%	33.04%
JSC	37.54%	22.63%	2.89%
Note: percentages may not add up to 100% due to rounding.			

44. When including non-compensable retransmitted WGN programming, Dr. Israel's original regulated fees model implies that Program Suppliers' royalty share increases from 26.82% to 56.08% and JSC's royalty share decreases from 37.54% to 22.63% over 2010-2013. Thus, considering all programming distantly retransmitted by CSOs, Dr. Israel's model indicates that CSOs value Program Suppliers' programming more than any other category's programming, including JSC programming.

45. In addition to the value of both compensable and non-compensable programming to their subscribers, CSOs continued to retransmit WGN for other reasons. Namely, CSOs continued to retransmit WGN due to WGN station owner's bundling requirements, CSO legacy carriage incentives, and CSO cost considerations.[17] From 1994 through 2010, CSOs were required by WGN's owner, Tribune Media, to carry WGN if the CSOs were to carry other major in-market network affiliates also provided by Tribune Media. Due to this bundling, many CSOs carried WGN.[18] As described by Ms. Hamilton, once a CSO has carried a station for an extended period, the risk of losing subscriber constituencies disincentivizes them from dropping carriage. Ms. Hamilton refers to this a "legacy carriage" consideration.[19] The legacy carriage consideration is given additional

[17] Hamilton WDT, p. 6-8.

[18] *Ibid.*

[19] *Ibid.*

weight given the small portion of a typical CSO's overall programming budget devoted to distant signal carriage.

E. The Categorization of Retransmitted Programming

46. I understand the purpose of this proceeding is ultimately to distribute royalties that have been paid to the Copyright Office for the benefit of the copyright owners, or their representatives, of distantly retransmitted programming. My written direct testimony, as well as the written direct testimonies of the economists I respond to in this testimony, attempt to quantify the share of paid royalties that should be allocated to agreed-upon categories of compensable programming. While the category definitions have been agreed to by the parties involved, and adopted by the Judges, they are not standard categories understood by the market.[20]

47. Nonetheless, to determine category royalty shares it was necessary to assign every program carried by retransmitted signals to one of the party's categories. This task of categorization was carried out by the economics experts, or in the cases of Dr. George and Dr. Crawford, their supporting experts. Dr. George's supporting expert is Mr. Bourdeau and Dr. Crawford's supporting expert is Dr. Bennett. On average, there were over 13 million program retransmissions each year from 2010 through 2013 (Gray WDT, Table 1). Classifying the retransmissions into one of the six agreed upon claimant categories was a significant undertaking requiring reliance on third-party data describing characteristics of each broadcasted program that aired on retransmitted stations.

48. Dr. Israel and I relied upon information in Gracenote data fields, Dr. Bennett relied upon information in the FYI data fields, and Mr. Bourdeau relied upon information in the CRTC logs, to assign individual programs to one of the agreed-upon program categories.

49. An advantage of the FYI database is that Dr. Bennett could acquire information for the entire universe of all US, Canadian, and Mexican signals distantly retransmitted

[20] *See* Hamilton WDT p. 8-12.

by CSOs. Dr. Israel and I relied upon random samples stations from the Gracenote data. The Gracenote data maintain different details concerning the programs that aired every day from 2010 to 2013 than does the FYI data.

50. I compared the category classification I made in my initial testimony to Dr. Bennet's, relying upon the approximately millions of programs airing on retransmitted signals each year from 2010-2013. Our categorization algorithms assigned programs to the same claimant category for 93.5% of the broadcasts being retransmitted. For the 6.5% of programs carried on retransmitted signals where our algorithms disagreed, it is difficult to determine which categorization is correct without doing a program-by-program review.

51. To gauge whether there was any bias in my categorization algorithm, or in the Gracenote data I relied upon, I repeated my distant viewing calculations for each royalty year, but replaced my determination of each program's category with that determined by Dr. Bennett relying on the FYI data. Table 9 below presents distant viewing shares by program category and royalty year relying on my classification algorithm described in my initial testimony as well as viewing shares relying upon Dr. Bennett's program classifications.

52. The viewership shares relying upon Dr. Bennett's program classifications are similar, though modestly different from, the viewership shares I reported in the initial testimony and reproduced in Table 5 above. Program Suppliers' viewership shares are higher in each royalty year using Dr. Bennett's classifications, whereas CTV's viewership shares are higher in each royalty year adopting my original classification methodology. This is consistent with no bias in intent on the part of Dr. Bennett or me.

Table 9: Distant Viewing Shares by Royalty Year Using Original Classification and CTV/Bennett Classification			
Year	*Claimant Category*	*Original Classification Share of Distant Viewing*	*CTV/Bennett Classification Share of Distant Viewing*
2010	Canadian Claimants	1.96%	1.14%
	Commercial Television	15.83%	12.70%
	Devotionals	1.18%	1.28%
	Program Suppliers	50.94%	52.74%
	Public Television	27.96%	30.04%
	JSC	2.13%	2.09%
	Total	**100%**	**100%**
2011	Canadian Claimants	3.93%	2.77%
	Commercial Television	12.06%	8.70%
	Devotionals	2.44%	2.45%
	Program Suppliers	49.92%	53.72%
	Public Television	29.09%	29.71%
	JSC	2.57%	2.65%
	Total	**100%**	**100%**
2012	Canadian Claimants	3.58%	2.77%
	Commercial Television	15.48%	11.48%
	Devotionals	1.07%	1.17%
	Program Suppliers	36.17%	40.66%
	Public Television	41.64%	41.86%
	JSC	2.06%	2.06%
	Total	**100%**	**100%**
2013	Canadian Claimants	5.31%	3.72%
	Commercial Television	10.64%	7.95%
	Devotionals	1.09%	1.30%
	Program Suppliers	44.69%	48.59%
	Public Television	33.47%	33.46%
	JSC	4.80%	4.98%
	Total	**100%**	**100%**

IV. ADDITIONAL ARGUMENTS BY DRS. CRAWFORD AND ISRAEL

53. Again, I understand the purpose of this proceeding is ultimately to distribute royalties that have been paid to the Copyright Office for the benefit of the copyright

owners, or their representatives, of distantly retransmitted programming. As described below, Dr. Israel's analysis of large cable system's programming expenditures and Dr. Crawford's comments on the importance of programming heterogeneity are not relevant to CSO's carriage choices concerning distant signals and should not be considered in how to distribute paid royalties to copyright owners.

A. Irrelevance of Dr. Crawford's Distant Signal Heterogeneity Analysis

54. CSOs do not offer individual programs on broadcast stations they retransmit to their subscribers. Nor do CSOs offer individual broadcast stations they retransmit to their subscribers *a la carte*. Instead, as described in my initial testimony, CSOs offer bundled distant signal channels, cable channels, local broadcast channels and pay-per-view channels in different packages to existing and potential subscribers at varying prices.[21] In his written direct testimony, Dr. Crawford described the economic incentive for CSOs to bundle channels with dissimilar programming such as channels devoted to sports, news, and weather programming.[22]

55. I agree with the economic principles described by Dr. Crawford concerning CSOs' incentive to bundle together cables channels with dissimilar programming to maximize revenue in the face of heterogeneous subscriber preferences. However, in this proceeding we are not attempting to estimate the relative market value of a sports cable channel, of a news cable channel, or of a weather cable channel. We are interested in assessing the relative market value of aggregated groups of programming that aired on *broadcast stations* which were distantly retransmitted by CSOs. While the programs that aired on signals had value to subscribers in distant markets, as evidenced by their viewing, I have not seen any evidence to suggest that the type of programming on the distantly retransmitted stations is markedly different from the content currently bundled by CSOs.

56. Testimony by a former CSO executive, with responsibilities that included managing the cable system's programming budget and selecting broadcast stations for

[21] Gray WDT par. 11-12.

[22] Crawford WDT, Section II.A.2.

distant carriage, is consistent with the expectation that the heterogeneity of programming on distantly retransmitted signals is not an important factor in carriage decisions.[23] Instead, important factors include (1) what subscribers wanted to watch, as demonstrated by subscriber viewing behavior, competitor carriage, and subscriber surveys, and (2) legacy carriage.[24] Overall, CSOs' distant signal carriage decisions represent a small portion of CSOs' programming budgets.

B. Irrelevance of Dr. Israel's Cable Channel Expenditures Analysis

57. Again, CSOs bundle distant signal channels, cable channels, local broadcast channels and pay-per-view channels in different packages and offer them to existing and potential subscribers at varying prices. As described in the previous subsection, CSOs have a revenue maximizing incentive to bundle together a variety of different types of programming to attract and maintain as many subscribers, with different tastes in programming, as possible. Broadcast and cable channels face different economic incentives than do CSOs. Broadly speaking, local broadcast stations seek to package programming to attract viewers of various demographic groups to maximize advertising revenue, while minimizing their cost of acquiring the programming; basic cable channels seek to package content that is attractive to CSOs to be included in bundled offerings CSOs offer to their subscribers. In addition, broadcast stations are principally advertising revenue-supported while basic cable networks are supported by per subscriber fees paid by the CSOs. These economic incentives give rise to different cable channels offering niche programming, such as cooking channels, weather channels, news channels, and so on.

58. The economic incentives of cable networks and broadcast stations have contributed to the migration of live-team sports programming from broadcast television to cable networks including ESPN, Regional Sports Networks, TNT, TBS, and cable channels owned by sports leagues and college conferences. Due to this migration, the

[23] Hamilton WDT, p. 5-8.

[24] *Ibid,* pp. 5-6.

volume of non-network live team sports carried by distantly retransmitted signals was very small over the 2010-2013 time period.[25]

59. While CSOs may place a high value on live team sports programming carried by certain cable networks, as described by Dr. Crawford, economic principles suggest they bundle these sports-focused cable networks with other cable channels, distant signal channels, and local broadcast channels each with little or no sports programming.

60. Therefore, Dr. Israel's analysis of certain cable networks' relative expenditures on live team sports is irrelevant to this proceeding. The expenditures of cable networks such as TBS, TNT, and ESPN on live team sports programming does not provide information on CSOs' willingness to pay for the various types of programming carried by distantly retransmitted broadcast signals. To the contrary, consistent with Dr. Crawford's economic arguments, after negotiating programming deals with cable networks carrying live team sports programming, CSOs may then have a sufficient quantity of that type of programming to bundle for its current and potential subscribers. That is, live team sports programming would be less valuable to CSOs than other types of programming.

V. CSO SURVEY RESPONSES VS. ACTUAL MARKETPLACE BEHAVIOR

61. As an alternative to analyzing market choices made by subscribers, or CSOs, to quantify the relative market value of programming, JSC sponsored the Bortz Survey. A similar survey of CSOs was performed by Mr. Horowitz ("Horowitz Survey") who was retained on behalf of the Program Suppliers.

62. In his written direct testimony, Dr. Steckel described the fundamental principles of sound survey design. ("Steckel WDT"). He then proceeded to delineate how both the Bortz and Horowitz Survey methodologies violated many of these tenets. He concluded that neither survey alone provides a reasonable basis for measuring marketplace value, but the Horowitz Survey is preferred as it adjusts for some of the Bortz Survey major flaws. I agree with his conclusion.

[25] *See* Gray WDT, Table 1; Hamilton WDT, Section IV.B; and Mansell WDT, p. 33-37.

63. The methodological flaws and associated usefulness of the two surveys notwithstanding, Table 10 below presents the share distribution of how CSO survey respondents answered, on average, how they would allocate a hypothetical fixed dollar budget across specified categories.

Table 10: Horowitz and Bortz Survey Results of CSO Respondents Hypothetical Allocation of Fixed Dollar Amount Across Programming Categories< 2010-2013 Averages

Programming Type	*Horowitz Survey*	*Bortz Survey*
News & Community/Public Affairs	12.6%	20.6%
Syndicated Series	17.5%	14.7%
Movies	13.3%	16.3%
Live team professional and college sports	30.0%	38.2%
Other sports programming	8.5%	Not Asked
Devotional programming	4.7%	4.6%
Programs on PBS stations	12.9%	5.1%
Programs on Canadian stations	0.6%	0.5%

Note: Highlighted programming type fall under the Program Suppliers category.

64. As is evident in Table 10 above, a significant difference between the Horowitz and Bortz Surveys is the number of program types CSO respondents were asked to allocate a fixed dollar amount across. While the Bortz Survey includes a category for "live team professional and college sports" programming, it does not include a category for "other sports programming." Other sports programming consists of non-live team sports such as tennis and golf tournaments, automobile races including NASCAR, triathlon competitions, the Olympics, boxing, and Mixed Martial Arts (MMA). This type of sports programming, I understand, falls within the Program Suppliers category for this proceeding.

65. An analysis of the Gracenote programming data and Nielsen viewing data described in my initial testimony indicates that the Bortz Survey's omission of the other sports programming category is a substantial omission. Whereas sports programming

falling under the JSC category averaged 3,665,435 distantly retransmitted minutes per royalty year, sports programming falling under the Program Suppliers category averaged 1,451,808 distantly retransmitted minutes per royalty year.

66. The Bortz Survey asked survey respondents to allocate a fixed dollar amount across a *subset* of the type of programming that was available on signals available for retransmission. It is possible that, without the option to consider allocating any of their hypothetical resources to the other sports category, respondents conflated Program Suppliers sports programming with JSC's live team sports programming. Results from the Horowitz survey are consistent with this possibility as respondents' fixed-dollar allocation share to live team sports programming (30.0%) plus other sports programming (8.5%) was similar to respondents' only sports option allocation in the Bortz survey (38.2%).

67. A second difference between the surveys is the Horowitz Survey more precisely defines the programming at issue in this proceeding, explicitly defining the definitions of "non-network programming" and "distant broadcast stations."[26] While the Horowitz Survey questions provided examples of programming for each category (and the Bortz Survey did not), it is unclear whether the respondents understood the quantity, or quality, of programming available on signals distantly retransmitted. It is Ms. Hamilton's opinion, as someone experienced with selecting broadcast stations to distantly retransmit, that CSOs responding to the Bortz and Horowitz surveys would not be able to accurately identify JSC programming without more information concerning program quantity and the nature of the programs.[27]

68. In addition to survey respondents being asked to allocate hypothetical funds across programming type where actual program quantity and quality are unknown, Dr. Steckel noted in his written direct testimony that survey research literature has determined that the question formats of both the Bortz and Horowitz Surveys, constant sum questions, do

[26] Direct Testimony of Howard Horowitz, Appendix A, p. 24.

[27] Hamilton, p. 13.

not exhibit the "strongest predictive validities."[28] This is evident comparing the survey results to actual choices made by subscribers as well as by those CSOs who faced cost implications of which stations to distantly retransmit. Table 11 below summarizes royalty shares based on market-based analyses reported earlier to contrast them with the royalty shares implied by the Horowitz and Bortz Surveys.

Table 11: Market-Based and CSO-Survey-Based Royalty Shares

	Subscriber Choices: Viewing		*CSO Choices: Regulated Fees Analysis*		*Constant Sum Surveys*	
Claimant Category	*Gray-Initial*	*Gray-Modified*	*Crawford-Modified*	*Israel-Modified*	*Horowitz Survey*	*Bortz Survey*
CCG	3.70%	2.60%	5.46%	4.15%	0.56%	0.53%
CTV	13.50%	10.21%	13.54%	27.20%	12.62%	20.63%
Devotionals	1.44%	1.55%	0.75%	0.64%	4.73%	4.58%
Program Suppliers	45.43%	48.93%	61.19%	44.27%	39.29%	31.00%
PTV	33.04%	30.04%	19.06%	19.55%	12.86%	5.10%
JSC	2.89%	2.95%	0.00%	4.19%	29.96%	38.23%

69. The market-based measures presented in Table 11 do not support the CSO survey results. The difference between the market-based royalty share measures and the survey-based measures is largest for the JSC category. This could be due to the intrinsic flaws in the survey methodologies, as delineated by Dr. Steckel's testimony, or due to both the migration of sports programming out of broadcast television and survey respondent errors, as suggested by Ms. Hamilton's testimony. The definition of JSC programming is narrower than what the cable industry considers sports programming.

70. Moreover, given the low supply of sports programming available on broadcast stations over 2010-2013, in an actual unregulated market, the CSO survey respondents would have been unlikely to devote the share of resources that they answered they might have devoted to sports programming.

71. I agree with Dr. Steckel's conclusions that the CSO surveys cannot assist the Judges in determining the relative market value of programming at issue in this

[28] Steckel WDT, p. 36.

proceeding, and, that market value is driven by consumer preferences.[29] One can ask what they want to watch or analyze what they watched. The latter is what I did in my initial testimony and the results reproduced in Table 11 above.

VI. CONCLUSION

72. As explained above, my conclusions regarding calculating the relative market value of programming described and reported in my initial testimony are unaltered by written direct testimony submitted on behalf of CCG, CTV, JSC, or the Devotionals. In my opinion, relative program viewership provides a reasonable and reliable measure of the relative economic value of distantly retransmitted programming, and should be utilized by the Judges as the basis for allocating royalties in this proceeding.

[29] Steckel WDT, pp. 7, 41.

APPENDIX A

Table A-1: Crawford Regression Replication

Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
Distant minutes Program Suppliers	0.00000208	0.00000021	10.76	0.00000170	0.00000246
Distant minutes Sports	0.00003330	0.00000382	10.27	0.00002700	0.00003970
Distant minutes CTV	0.00000445	0.00000060	8.21	0.00000339	0.00000552
Distant minutes Public	0.00000164	0.00000019	9.27	0.00000130	0.00000199
Distant minutes Devotional	0.00000089	0.00000032	2.91	0.00000029	0.00000150
Distant minutes Canadian	0.00000429	0.00000036	11.74	0.00000357	0.00000501
Permitted Stations	0.00111020	0.02415690	0.05	-0.04194280	0.04416320
Syndicated Exclusivity Surcharge	0.70434340	0.23493250	1.29	-0.36225090	1.77093800
3.75% fee	0.44616170	0.04359180	10.39	0.36197750	0.53034600
Laggged number of subscribers	0.00003720	0.00000233	27.72	0.00003460	0.00003990
Distant signals	-0.47944560	0.05048030	-10.02	-0.57323830	-0.38565280
Interaction Charter and Lagged Subs	0.00000991	0.00000681	4.58	0.00000567	0.00001410
Interaction Comcast and Lagged Subs	-0.00002780	0.00000250	-19.91	-0.00003060	-0.00002510
Interaction Time Warner and Lagged Subs	-0.00000973	0.00000291	-6.5	-0.00001270	-0.00000680
Interaction Verizon and Lagged Subs	-0.00002980	0.00000246	-19.86	-0.00003270	-0.00002680
Interaction Cox and Lagged Subs	-0.00001940	0.00000254	-9.17	-0.00002360	-0.00001530
Interaction Others and Lagged Subs	-0.00002160	0.00000295	-13.98	-0.00002460	-0.00001860
Local stations	0.04631400	0.00333920	17.72	0.04119200	0.05143600
Distant unmerged minutes	0.00000342	0.00000072	5.92	0.00000229	0.00000455
Distant minutes TBA	0.00000102	0.00000187	0.61	-0.00000227	0.00000431
Constant	6.90076700	0.07087710	121.39	6.78933800	7.01219600

Table A-2: Israel Regression Replication

Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.4693279	0.1037529	4.52	0.2659306	0.6727251
d_Sports	4.836397	2.46633	1.96	0.0014033	9.67139
d_Comm_TV	1.009978	0.3549573	2.85	0.31412	1.705837
d_Pub_Broad	0.6601077	0.3055814	2.16	0.0610461	1.259169
d_Devotional	-0.7010084	0.2459957	-2.85	-1.183258	-0.2187584
d_Canadian	-0.972506	0.2123176	-4.58	-1.388733	-0.5562787
d_Network	-0.9845382	0.2902276	-3.39	-1.5535	-0.4155761
d_other	0.9164661	0.4622938	1.98	0.0101855	1.822747
prev_soasubscribers	1.351383	0.0600544	22.5	1.233652	1.469113
prev_channelsactivated	141.8119	18.73303	7.57	105.0877	178.5361
medianincome	1.338665	0.2856631	4.69	0.7786508	1.898679
channelsbroadcast	-493.511	326.5168	-1.51	-1133.614	146.5924
rate375	41917.92	4711.349	8.9	32681.79	51154.05
minimum_pay	-16501.17	3689.076	-4.47	-23733.24	-9269.11
Per_2	-4229.919	4837.96	-0.87	-13714.26	5254.417
Per_3	-1579.701	5020.054	-0.31	-11421.01	8261.612
Per_4	-1066.388	5363.864	-0.2	-11581.71	9448.93
Per_5	7467.661	6098.045	1.22	-4486.944	19422.27
Per_6	5585.385	6437.822	0.87	-7035.319	18206.09
_cons	-102874.7	14640.35	-7.03	-131575.6	-74173.75

Table A-3: George Regression Replication					
Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
wdchours	88.87743	32.92006	2.7	24.31935	153.4355
wdjhours	906.8371	774.1472	1.17	-611.3087	2424.983
wdphours	-293.7664	121.0112	-2.43	-531.0761	-56.45678
wdncshours	44.09334	5.294496	8.33	33.71054	54.47614
lsystemsub	0.7963635	0.04409	18.06	0.7099004	0.8828265
lchannels00	95.68327	18.01655	5.31	60.3518	131.0147
cndC	-18272.75	6039.841	-3.03	-30117.22	-6428.29
cndE	-1680.662	1349.807	-1.25	-4327.709	966.3847
cndI	-33.97132	403.4433	-0.08	-825.1462	757.2036
cndL	5053.886	8107.175	0.62	-10844.74	20952.51
cndN	2930.076	900.4988	3.25	1164.148	4696.005
has375	16300.34	4571.023	3.57	7336.308	25264.37
pDSEl1	-18159.54	3989.138	-4.55	-25982.46	-10336.62
merger	-26891.4	16459.22	-1.63	-59168.84	5386.048
pop	0.0408099	0.0042719	9.55	0.0324325	0.0491873
wminc	-0.1359183	0.0691983	-1.96	-0.27162	-0.0002166
t					
2010_2	1237.733	4971.187	0.25	-8511.041	10986.51
2011_1	-1962.321	5574.24	-0.35	-12893.72	8969.076
2011_2	345.3621	5271.567	0.07	-9992.474	10683.2
2012_1	9869.039	6138.014	1.61	-2167.948	21906.03
2012_2	11550.63	5954.644	1.94	-126.7584	23228.02
2013_1	10236.02	5969.962	1.71	-1471.406	21943.45
2013_2	13137.22	6157.873	2.13	1061.284	25213.15
_cons	-57781.25	8645.677	-6.68	-74735.9	-40826.59

APPENDIX B

Table B-1: Modified Crawford Regression

Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
Distant minutes Program Suppliers	0.00000416	0.00000019	21.86	0.00000379	0.00000453
Distant minutes Sports	-0.00000006	0.00000559	-0.01	-0.00001100	0.00001090
Distant minutes CTV	0.00000272	0.00000060	4.55	0.00000155	0.00000389
Distant minutes Public	0.00000142	0.00000014	10.39	0.00000115	0.00000169
Distant minutes Devotional	-0.00000103	0.00000094	-1.09	-0.00000081	0.00000287
Distant minutes Canadian	0.00000433	0.00000057	7.67	0.00000322	0.00000544
Permitted Stations	-0.03602310	0.00590990	-6.1	-0.04761000	-0.02443630
Syndicated Exclusivity Surcharge	0.80433960	0.37130630	2.17	0.07635980	1.53231900
3.75% fee	1.17623900	0.04916620	23.92	1.07984500	1.27263400
Laggged number of subscribers	0.00000421	0.00000115	3.66	0.00000195	0.00000647
Distant signals	0.02821040	0.00494820	5.7	0.01850910	0.03791180
Interaction Charter and Lagged Subs	0.00000289	0.00000156	1.86	-0.00000016	0.00000594
Interaction Comcast and Lagged Subs	-0.00000201	0.00000118	-1.7	-0.00000432	0.00000031
Interaction Time Warner and Lagged Subs	-0.00000316	0.00000125	-2.53	-0.00000561	-0.00000071
Interaction Verizon and Lagged Subs	-0.00000177	0.00000141	-1.26	-0.00000452	0.00000099
Interaction Cox and Lagged Subs	0.00000618	0.00000150	4.11	0.00000323	0.00000913
Interaction Others and Lagged Subs	-0.00000126	0.00000120	-1.05	-0.00000362	0.00000110
Local stations	0.00198920	0.00038300	5.19	0.00123830	0.00274010
Distant unmerged minutes	0.00000652	0.00000131	4.99	0.00000396	0.00000908
Distant minutes TBA	0.00001210	0.00000284	4.27	0.00000656	0.00001770
Charter	0.52984310	0.13836820	3.83	0.25855960	0.80112660
Comcast	0.83404190	0.13464540	6.19	0.57005730	1.09802700
Time Warner	0.85392800	0.14971140	5.7	0.56040510	1.14745100
Verizon	3.02900200	0.40862220	7.41	2.22786100	3.83014400
Cox	0.44375200	0.18435510	2.41	0.08230700	0.80519700
Others	0.32237870	0.12264970	2.63	0.08191280	0.56284460
20102	-0.02061860	0.08184670	-0.25	-0.18108660	0.13984940
20111	-0.00774800	0.08242830	-0.09	-0.16935630	0.15386030
20112	-0.04674470	0.08435340	-0.55	-0.21212730	0.11863790
20121	0.01433080	0.08675030	0.17	-0.15575110	0.18441270
20122	-0.03113230	0.08718460	-0.36	-0.20206570	0.13980110
20131	-0.08414170	0.08777210	-0.96	-0.25622690	0.08794340

20132	-0.08975770	0.08825300	-1.02	-0.26278590	0.08327040
Constant	5.95555600	0.14198260	41.95	5.67718600	6.23392600

APPENDIX C

Table C-1: Israel Regression - Splitting Non Compensable minutes

Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
WGN_d_Prog_Supp	0.4197273	0.1025823	4.09	0.218625	0.6208295
WGN_d_NC_Prog_Supp	0.8783349	0.5940699	1.48	-0.2862797	2.04295
d_Sports	-4.042402	3.187437	-1.27	-10.29105	2.206249
d_Comm_TV	1.808528	0.40472	4.47	1.015115	2.601941
d_Pub_Broad	0.806503	0.315594	2.56	0.1878125	1.425193
WGN_d_Devotional	-0.8812088	0.254051	-3.47	-1.37925	-0.3831672
WGN_d_NC_Devotional	1.579644	7.218488	0.22	-12.57148	15.73077
d_Canadian	-0.6314481	0.1855997	-3.4	-0.9952978	-0.2675984
d_Network	-0.9054625	0.2875236	-3.15	-1.469124	-0.3418014
d_other	1.024824	0.4690267	2.19	0.1053444	1.944304
prev_soasubscribers	1.350359	0.0599564	22.52	1.232821	1.467898
prev_channelsactivated	138.8511	18.54987	7.49	102.4859	175.2163
medianincome	1.408955	0.2902127	4.85	0.8400217	1.977888
channelsbroadcast	-483.3794	325.3904	-1.49	-1121.275	154.5159
rate375	43180.18	4791.171	9.01	33787.57	52572.79
minimum_pay	-15368.34	3657.171	-4.2	-22537.85	-8198.816
Per_2	2988.859	5128.106	0.58	-7064.28	13042
Per_3	4568.918	5571.838	0.82	-6354.112	15491.95
Per_4	2022.901	6485.275	0.31	-10690.83	14736.63
Per_5	11210.93	8052.004	1.39	-4574.221	26996.08
Per_6	12499.98	7134.948	1.75	-1487.374	26487.33
_cons	-116098.6	15595.57	-7.44	-146672.2	-85525.04

Table C-2: Israel Regression - Log Royalty Fee					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.00000744	0.00000089	8.39	0.00000570	0.00000918
d_Sports	-0.00000156	0.00001970	-0.08	-0.00004020	0.00003710
d_Comm_TV	0.00003250	0.00000401	8.11	0.00002470	0.00004040
d_Pub_Broad	-0.00000390	0.00000187	-2.09	-0.00000757	-0.00000024
d_Devotional	0.00000532	0.00000261	2.04	0.00000020	0.00001040
d_Canadian	0.00000046	0.00000160	0.29	-0.00000268	0.00000361
d_Network	-0.00002280	0.00000314	-7.26	-0.00002890	-0.00001660
d_other	0.00001060	0.00000317	3.33	0.00000435	0.00001680
prev_soasubscribers	0.00000517	0.00000027	18.90	0.00000463	0.00000570
prev_channelsactivated	0.00206130	0.00009300	22.16	0.00187900	0.00224370
medianincome	0.00000748	0.00000118	6.32	0.00000516	0.00000980
channelsbroadcast	0.00519820	0.00125000	4.16	0.00274780	0.00764870
rate375	0.40367960	0.02672630	15.10	0.35128540	0.45607370
minimum_pay	-0.06085000	0.02756950	-2.21	-0.11489730	-0.00680280
Per_2	-0.07312380	0.03699020	-1.98	-0.14563950	-0.00060820
Per_3	-0.07761480	0.03653810	-2.12	-0.14924420	-0.00598540
Per_4	-0.13065470	0.03604340	-3.62	-0.20131410	-0.05999530
Per_5	-0.10859340	0.03811660	-2.85	-0.18331730	-0.03386960
Per_6	-0.17020630	0.04011770	-4.24	-0.24885310	-0.09155950
_cons	8.80706600	0.06772000	130.05	8.67430800	8.93982400

Table C-3: Israel Regression - Royalty over minimum					
Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.3766046	0.0614288	6.13	0.2561796	0.4970295
d_Sports	-0.1629718	1.316926	-0.12	-2.744673	2.418729
d_Comm_TV	1.310296	0.2219662	5.9	0.8751532	1.745438
d_Pub_Broad	0.5170267	0.1371004	3.77	0.2482551	0.7857982
d_Devotional	-0.5187264	0.1429903	-3.63	-0.7990445	-0.2384082
d_Canadian	0.125472	0.1124229	1.12	-0.0949217	0.3458657
d_Network	-0.5917609	0.1881096	-3.15	-0.9605309	-0.2229909
d_other	0.8405723	0.2795509	3.01	0.2925407	1.388604
prev_soasubscribers	0.1322358	0.0212329	6.23	0.0906108	0.1738607
prev_channelsactivated	55.0479	7.884912	6.98	39.59032	70.50548
medianincome	0.234927	0.0833782	2.82	0.0714724	0.3983816
channelsbroadcast	-281.8809	130.3493	-2.16	-537.4176	-26.34415
rate375	36302.27	2798.74	12.97	30815.62	41788.92
minimum_pay	-12471.1	1626.929	-7.67	-15660.53	-9281.666
Per_2	618.7489	2553.365	0.24	-4386.867	5624.365
Per_3	612.886	2617.627	0.23	-4518.709	5744.481
Per_4	-2150.27	2809.418	-0.77	-7657.852	3357.311
Per_5	-484.025	3110.544	-0.16	-6581.935	5613.885
Per_6	1725.703	3242.029	0.53	-4629.969	8081.376
_cons	-32391.53	5595.567	-5.79	-43361.08	-21421.98

Table C-4: Israel Regression - Log Royalty Fee over minimum					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.00002830	0.00000185	15.29	0.00002470	0.00003190
d_Sports	0.00002730	0.00004060	0.67	-0.00005230	0.00010700
d_Comm_TV	0.00005500	0.00000712	7.72	0.00004100	0.00006900
d_Pub_Broad	0.00004100	0.00000403	10.18	0.00003310	0.00004890
d_Devotional	0.00000515	0.00000561	0.92	-0.00000584	0.00001610
d_Canadian	0.00003050	0.00000334	9.14	0.00002400	0.00003710
d_Network	0.00003390	0.00000568	5.98	0.00002280	0.00004510
d_other	0.00004180	0.00000547	7.65	0.00003110	0.00005250
prev_soasubscribers	0.00000395	0.00000030	13.42	0.00000338	0.00000453
prev_channelsactivated	0.00089540	0.00022070	4.06	0.00046270	0.00132810
medianincome	0.00000792	0.00000331	2.39	0.00000142	0.00001440
channelsbroadcast	0.00786720	0.00229840	3.42	0.00336050	0.01237380
rate375	1.55585600	0.05620620	27.68	1.44564700	1.66606500
minimum_pay	-8.35046400	0.26057170	-32.05	-8.86139400	-7.83953300
Per_2	-0.04658080	0.09813270	-0.47	-0.23899990	0.14583830
Per_3	-0.07684890	0.09425610	-0.82	-0.26166690	0.10796900
Per_4	-0.12057540	0.09693240	-1.24	-0.31064100	0.06949010
Per_5	-0.07818780	0.10016590	-0.78	-0.27459360	0.11821810
Per_6	-0.16294460	0.10451790	-1.56	-0.36788390	0.04199470
_cons	5.42709500	0.18722750	28.99	5.05997800	5.79421100

APPENDIX D

Table D-1: George Regression - Log Royalty Fee					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
wdchours	0.00072080	0.00039920	1.81	-0.00006200	0.00150370
wdjhours	0.00775860	0.00901550	0.86	-0.00992120	0.02543850
wdphours	-0.00172590	0.00130550	-1.32	-0.00428600	0.00083430
wdncshours	0.00037720	0.00005370	7.02	0.00027180	0.00048250
lsystemsub	0.00000277	0.00000028	10.06	0.00000223	0.00000331
lchannels00	0.00188340	0.00010680	17.64	0.00167400	0.00209280
cndC	-0.11763260	0.04719470	-2.49	-0.21018400	-0.02508120
cndE	0.00171530	0.00651880	0.26	-0.01106830	0.01449900
cndI	0.01850720	0.00405710	4.56	0.01055090	0.02646340
cndL	0.00645260	0.05806780	0.11	-0.10742170	0.12032690
cndN	-0.02010550	0.00647060	-3.11	-0.03279460	-0.00741630
has375	0.28977640	0.03982520	7.28	0.21167700	0.36787590
pDSEl1	-0.23178330	0.04218760	-5.49	-0.31451570	-0.14905100
merger	0.10006510	0.08904800	1.12	-0.07456290	0.27469320
pop	0.00000024	0.00000002	13.15	0.00000020	0.00000027
wminc	-0.00000970	0.00000098	-9.86	-0.00001160	-0.00000777
t					
2010_2	-0.06147280	0.05639200	-1.09	-0.17206070	0.04911520
2011_1	-0.09970780	0.05655600	-1.76	-0.21061720	0.01120170
2011_2	-0.17029590	0.05801050	-2.94	-0.28405780	-0.05653390
2012_1	-0.17583660	0.06005430	-2.93	-0.29360650	-0.05806660
2012_2	-0.18939160	0.06173820	-3.07	-0.31046370	-0.06831960
2013_1	-0.20699240	0.06200730	-3.34	-0.32859220	-0.08539260
2013_2	-0.20117410	0.06318680	-3.18	-0.32508700	-0.07726130
_cons	9.62680500	0.06652330	144.71	9.49634900	9.75726000

Table D-2: George Regression - Log Royalty Fee, No minimum					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
wdchours	0.00082400	0.00044360	1.86	-0.00004630	0.00169420
wdjhours	0.01381890	0.00993840	1.39	-0.00568090	0.03331860
wdphours	-0.00251750	0.00139920	-1.8	-0.00526290	0.00022780
wdncshours	0.00034650	0.00006230	5.56	0.00022430	0.00046860
lsystemsub	0.00000302	0.00000024	12.81	0.00000255	0.00000348
lchannels00	0.00161100	0.00014310	11.26	0.00133030	0.00189180
cndC	-0.23838080	0.06281370	-3.8	-0.36162560	-0.11513600
cndE	-0.00653410	0.00869570	-0.75	-0.02359560	0.01052750
cndI	0.02157170	0.00574290	3.76	0.01030380	0.03283970
cndL	-0.15438660	0.07525740	-2.05	-0.30204680	-0.00672640
cndN	-0.02296740	0.00843140	-2.72	-0.03951040	-0.00642440
has375	0.24939480	0.04751460	5.25	0.15616790	0.34262160
pDSEI1	0.00000000	(omitted)			
merger	0.05629070	0.10295120	0.55	-0.14570670	0.25828810
pop	0.00000024	0.00000003	8.33	0.00000018	0.00000030
wminc	-0.00001080	0.00000153	-7.05	-0.00001370	-0.00000776
t					
2010_2	-0.04146550	0.08028460	-0.52	-0.19898940	0.11605850
2011_1	-0.08523360	0.08129080	-1.05	-0.24473190	0.07426460
2011_2	-0.15963690	0.08092100	-1.97	-0.31840950	-0.00086430
2012_1	-0.15598980	0.08388960	-1.86	-0.32058700	0.00860740
2012_2	-0.14699000	0.08764450	-1.68	-0.31895450	0.02497450
2013_1	-0.20694630	0.08826690	-2.34	-0.38013210	-0.03376050
2013_2	-0.19288670	0.09078440	-2.12	-0.37101200	-0.01476150
_cons	9.82254300	0.09544150	102.92	9.63528100	10.00981000

EXHIBIT B

Before the
COPYRIGHT ROYALTY JUDGES
Washington, D.C.

In re	
DISTRIBUTION OF CABLE ROYALTY FUNDS	DOCKET NO. 14-CRB-0010-CD (2010-13)

REBUTTAL TESTIMONY OF JEFFREY S. GRAY, PH.D.

September 15, 2017

Corrected November 3, 2017

Table of Contents

I. INTRODUCTION

1. I, Jeffrey Gray, am an economist and President of Analytics Research Group, LLC. I provided initial testimony in this proceeding, which was filed on December 22, 2016 ("Gray WDT"), amended on March 9, 2017, and corrected on April 3, 2017. A description of my background and experience, as well as a copy of my *curriculum vitae*, was included with that testimony.

2. I understand that the purpose of this proceeding is to allocate the 2010, 2011, 2012, and 2013 cable royalty funds ("2010-2013 Cable Royalties"), paid by Cable System Operators ("CSOs") under statutory licenses established by Section 111 of the Copyright Act ("Section 111"), among broad self-organized claimant group categories.[1] In my initial testimony, I provided what I believe to be a sound, reliable methodology to estimate what the relative market value of distantly retransmitted programming would be in an unregulated market. I performed calculations to determine this relative market value on a *program-by-program* basis, and then summed these individual relative market values to determine the relative market value of programming by each agreed-upon program category.[2]

3. I have been asked by the Program Suppliers claimant group to respond to the amended and corrected written direct testimonies of Drs. Gregory S. Crawford, Mark A. Israel, Lisa M. George, and Christopher J. Bennett.

4. Drs. Crawford and Bennett provided testimony on behalf of the Commercial Television Claimants ("CTV"); Dr. Israel, on behalf of the Joint Sports Claimants ("JSC"); and Dr. George, on behalf of the Canadian Claimants Group ("CCG");

[1] Historically, for cable Phase I Proceedings there have been eight broad categories of programming: (1) Program Suppliers; (2) Joint Sports Claimants ("JSC"); (3) Commercial Television Claimants ("Commercial Television""); (4) Public Television Claimants ("Public Television"); (5) Devotional Claimants ("Devotionals"); (6) Canadian Claimants Group ("Canadian Claimants"); (7) Music Claimants; and (8) National Public Radio ("NPR"). The Judges adopted these eight categories of programming for this proceeding as well. *See* Notice of Participant Groups, Commencement of Voluntary Negotiation Period (Allocation), and Scheduling at Exhibit A (November 25, 2015) ("Notice").

[2] Gray WDT.

describing alternative distribution methodologies with correspondingly alternative proposed royalty share allocations.[3]

5. I understand that the Program Suppliers have asked Dr. Joel Steckel and Mr. Howard Horowitz to respond to the written direct testimony of Mr. James M. Trautman, who has submitted results from a survey of CSOs, the "Bortz Survey,"[4] to assess the relative market value of programming at issue in this proceeding. I also provide my opinion on the usefulness of surveying CSOs in this context, as well as the relative usefulness of the Bortz Survey results and the survey results from an alternative survey overseen by Mr. Horowitz. Finally, my testimony includes comments on the written direct testimony of Dr. Erkan Erdem, who provided testimony on behalf of the Settling Devotional Claimants ("Devotionals").[5]

6. My testimony is based upon information currently available to me. I reserve the right to supplement this testimony should additional information be made available.

II. SUMMARY OF OPINIONS

7. For the reasons set out below, my conclusions regarding calculating the relative market value of programming described and reported in my initial testimony are unaltered by written direct testimony submitted on behalf of CCG, CTV, JSC, or the Devotionals.

8. Necessary modifications made to the regression models proposed by opposing parties' experts to reflect the regulated structure of 2010-2013 royalty payments made by

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[3] Testimony of Gregory S. Crawford, PhD, Corrected April 11, 2017 ("Corrected Crawford WDT"); Testimony of Christopher J. Bennett PhD, Corrected April 11, 2017; Written Direct Statement of Lisa M. George PhD, Corrected May 17, 2017 ("George WDT"); Written Direct Testimony of Dr. Mark A. Israel, December 22, 2016 ("Israel WDT"); Written Direct Testimony Michelle Connolly, Ph.D., December 22, 2016.

[4] *See In the Matter of Distribution of the 2010, 2011, 2012, and 2013 Cable Royalty Funds*, Written Direct Testimony of James M. Trautman (Dec. 22, 2016), *attachment*: Bortz Media & Sports Group, Inc., Cable Operator Valuation of Distant Signal Non-Network Programming: 2010-2013 (Dec. 22, 2016).

[5] Testimony of Erkan Erdem, Ph.D., March 9, 2017 ("Erdem WDT").

CSOs demonstrate that the regression results do not support the Bortz Survey results, and therefore do not support the royalty allocations suggested by the Bortz Survey.

9. Dr. Israel's analysis of large cable system's programming expenditures and Dr. Crawford's comments on the importance of programming heterogeneity are not relevant to CSO's carriage choices concerning distant signals and should not be considered in how to distribute royalties paid by CSOs to copyright owners.

10. Neither the Bortz Survey nor the Horowitz Survey provides a reasonable basis for measuring marketplace value. However, the Horowitz Survey is superior to the Bortz Survey as it corrects for some of the Bortz Survey's major flaws.

III. REGULATED FEES REGRESSION ANALYSES

11. Drs. Crawford and Israel used multiple regression analyses to calculate royalty shares for each claimant category for 2010-2013. Dr. George used multiple regression analyses to calculate royalty shares only for the CCG claimant category for 2010-2013. Multiple regression analysis calculates the individual influences that each of a set of independent (or explanatory) variables has on a specific variable chosen to study. The variable chosen to study is known as the dependent (or outcome) variable.

12. Table 1 below presents a summary of Drs. Crawford's, Israel's and George's regression methodologies and the data they relied upon to calculate their recommended royalty share allocations. In each of their regression models, the outcome variable is some form of the regulated royalty fees paid by CSOs. As detailed in Appendix A, the explanatory variables differ among the models, but both Dr. Crawford and Dr. Israel's regression models included total minutes of programming, or program volume, by each claimant category; whereas, Dr. George's explanatory variables included CCG programming minutes, JSC programming minutes, and Program Suppliers/Devotionals programming minutes, where Program Suppliers/Devotionals minutes is the sum of Devotional program minutes and Program Suppliers minutes. Because each multiple

regression model analyzes how a set of explanatory variables influences a regulated royalty fees, I refer to these three models as "regulated fees regressions."

Table 1: Summary of Regulated Fees Regressions

Claimant Group's Expert	*Crawford* *CTV*	*Israel* *JSC*	*George* *CCG*
Outcome Variable Analyzed	Natural Logarithm of Royalty Fees Paid	Royalty Fees Paid	Royalty Fees Paid
Number of Explanatory Variables in Final Model[*]	22	20	24
Data: Form 3 CSO Royalty Fees Analyzed	All CSOs in U.S.	Sample of CSOs in U.S.	Sample of CSOs with retransmissions in "Canadian Region" in U.S.[**]
Number of Observations in Final Model	26,126	5,465	2,198
Calculated Royalty Shares	All Claimant Groups	All Claimant Groups	CCG Claimants

[*]A list of the explanatory variables in the three final models is included in Appendix A.
[**]See George WDT, p. 51 for definition of Canadian Region.

13. The regulated fees regressions attempt to estimate how an additional minute of retransmitted programming, by claimant category, impacted the royalty fees paid by CSOs. None of the three regulated fees regressions estimate how prices would be determined, or even influenced by factors in a free, unregulated, market. Royalty fees paid by CSOs under Section 111 are set by statute and determined by the CSO's number and type of distant signal equivalents and gross receipts. They are not determined by the number of minutes of programming, or minutes by program category type, carried on the retransmitted signals.

14. CSO royalty payments are set by a *compulsory* license and Drs. Crawford, Israel, and George offer no evidence that such payments have any bearing on a CSO's willingness to pay for retransmitted signals. For example, CSOs with subscribers who place *no* value on the programming carried on retransmitted signals are still required to pay a mandated minimum royalty fee. In such circumstances, a regression analysis that

examines the relationship between the type of programming on those signals and the mandated CSO royalty fees paid, by construction, would generate non-probative (and potentially nonsensical) insights into the relative market value of programming carried on distantly retransmitted signals.

15. CSOs' mandatory minimum royalty fees requirement is not a theoretical curiosity. Actual choices made by CSOs concerning which, if any, broadcast signals to retransmit from 2010 through 2013 demonstrated that CSOs' regulated royalty payments often provided no information regarding how much CSOs may have valued their distantly retransmitted signals over those royalty years. Consequently, there is no economic justification to estimate their relative market value based on the regulated fees paid by all CSOs.

16. Each royalty year there are two accounting periods at the end of which CSOs are required to file Statements of Account ("SOAs") with the Licensing Division of the Copyright Office. These SOAs include information on the CSOs' gross receipts, which signals they distantly retransmitted, and the statutorily set royalty fees due as result of these retransmissions. In the 2010 to 2013 cable royalty years, CSOs could report royalties at the subscriber group level, defined as sets of communities that receive the same portfolio of distant broadcast signals.[6]

17. Each accounting period from 2010-2013, there averaged 1,004 Form 3 CSOs that paid royalties ostensibly giving the CSOs the right to retransmit stations on a distant basis. However, of these 1,004 CSOs, 527 chose to retransmit the exact or fewer number of signals than their regulated minimum fee allowed. Thus, these 527 CSOs' decisions did not impact their costs and their retransmission choices, and did not provide information regarding their willingness to pay for the right to retransmit the signals they chose. During the 2010-2013 period, 83 CSOs, on average, despite paying the regulated

[6] This resulted from the enactment of Satellite Television Extension and Localism Act of 2010.

minimum fee allowing them to distantly retransmit signals, chose not to retransmit any signals at all during each accounting period.

18. To the extent one wishes to rely on the statutorily-determined CSO payments at all, it is only when a CSO retransmitted more signals and/or type of signals than its regulated required minimum fee allowed that there may be some information in the royalty fees paid. The reason is that only in those cases did the CSO's decision incur an incremental cost to the CSO's regulatory set minimum fee requirement. While the increased regulatory cost for these CSOs was also set by statute, the incremental cost incurred does suggest an increased willingness to pay for the distantly retransmitted programming. This situation, where CSOs' retransmission choices incurred a royalty fee greater than their statutorily set minimum, occurred for 477 CSOs, on average, each accounting period, or 48% of all CSOs over the 2010-2013 royalty years.

19. As described in detail below, restricting Drs. Crawford's, Israel's, and George's regression analyses to those CSO choices where there may be some information regarding CSOs' willingness to pay for retransmissions has a significant impact on their findings, and therefore their recommended royalty allocations.

A. Crawford's Regulated Fees Regression

20. Dr. Crawford's regulated fees regression examined the relationship between the natural log of the royalty fees and the minutes of programming of the claimant categories carried on distant broadcast signals *within* a given subscriber group and accounting period. He included in his regression model other explanatory variables he believes might impact the royalty fees paid by CSOs.[7] By performing calculations within subscriber groups, Dr. Crawford attempted to measure how a CSO's selection of stations to retransmit to its subscriber groups impacted its calculated royalty fees attributed to that subgroup in the SOA. According to this logic, the greater the calculated royalty fees

[7] *See* Corrected Crawford WDT, Section VI.B. for a detailed discussion of his regression model. A list of explanatory variables in Dr. Crawford's model is included in Appendix A in this testimony.

based on stations retransmitted to subscriber groups, the greater the value of the station to the CSO. However, this logic fails when these calculated royalty fees do not exceed the CSO's required minimum fees.

21. Table 2 below presents an example of a CSO, whose calculated royalty fees were less than its required minimum fees, demonstrating the flaw in Dr. Crawford's logic and therefore his regulated fees regression methodology. In the second accounting period of 2010, Time Warner Cable NYC, a CSO in Bethel NY (CSO ID #NYN560), had gross receipts of $12,312,524 with an associated regulated minimum royalty fees requirement of $131,005. However, the final column reports that calculated royalty fees at the subscriber group level totaled only $93,152, or $37,854 *less than* the CSO's minimum fee requirement. Thus, the CSO could have retransmitted additional signals distantly and/or redistributed the stations it did retransmit across subscriber groups at no additional cost. This means that calculated subscriber group royalty fees reported in the final column do not measure, or provide any information regarding, the extent to which this CSO valued the signals it distantly retransmitted.

Table 2: Example of a CSO's calculated royalty fees being lower than the required minimum (and paid) royalties of $131,005. CSO ID #NYN560, Accounting Period 2010/2.

Subscriber Group	*Gross Receipts*	*# Distant Stations*	*Calculated Royalty Fees*
1	4,609,922	0	0
2	586,710	3	4,682
3	1,031,164	0	0
4	286,048	3	2,283
5	266,536	3	2,127
6	628,591	4	6,688
7	305,754	3	2,440
8	5,974	17	312
9	187,201	4	1,992
10	26,807	4	465
11	63,926	5	1,279
12	35,132	5	435
13	1,553,698	3	12,399
14	381,756	4	4,062
15	1,305,301	4	22,654
16	108,209	3	864
17	42,103	16	6,383
18	494,166	4	5,258
19	229,916	3	1,835
20	147,851	15	16,869
21	15,758	3	126
CSO TOTAL	**$ 12,312,524**	**106**	**$ 93,152**

22. Yet the Crawford regulated fees regressions relied upon these calculated subscriber group royalty fees to estimate the relative market value to CSOs of programming on distantly retransmitted signals. When these fees are not a binding, or incremental cost, the data simply do not inform the extent to which the CSO might be willing to pay to retransmit individual stations. With these royalty fees data, it is not possible to gauge the value of programming carried on those retransmitted stations to the CSO. Dr. Crawford's proposed royalty share allocations are therefore unreliable.

23. However, as I described earlier in paragraph 15 above, approximately half of CSOs chose to distantly retransmit a quantity and type of broadcast signals that caused their royalty fees paid to be greater than their statutorily mandated minimum fees over

2010-2013. For these CSOs, changing which or how many broadcast stations they retransmitted to each of their subscriber groups did impact the CSOs' costs. Applying Dr. Crawford's regulated fees regression analysis to this subset of CSOs could provide some information regarding the relative market value of the programming category types carried on the retransmitted signals. I do so in Table 3 below.

24. Column 1 in Table 3 below presents the average royalty shares over 2010-2013 based upon my attempted replication of Dr. Crawford's described regulated fees methodology to all CSOs. Column 2 presents each claimant category's calculated royalty shares applying Dr. Crawford's regulated fees regression methodology to the subset of CSOs who paid more than the minimum royalty fees, where adding or dropping retransmitted stations to subscriber groups would impact the CSOs' royalty fees paid, or cost. Column 3 shows my recommended allocation of 2010-2013 royalties which I present in my direct testimony.

Table 3: Impact of accounting for minimum fees requirement on Crawford royalty shares, 2010 – 2013

Claimant Category	*(1) Crawford Royalty Shares*	*(2) Crawford-Modified Royalty Shares*	*(3) Distant Viewing Royalty Shares*
CCG	3.51%	5.46%	3.70%
CTV	16.50%	13.54%	13.50%
Devotionals	0.60%	0.75%	1.44%
Program Suppliers	23.44%	61.19%	45.43%
PTV	17.72%	19.06%	33.04%
JSC	38.23%	0.00%	2.89%

25. Table 3 shows that while CTV's calculated royalty share drops from 16.50% to 13.54% when applying Dr. Crawford's model to the subset of relevant CSOs, the most dramatic changes occur with the Program Suppliers and JSC categories. While JSC's average royalty shares drops 38.23 percentage points to a zero share, Program Suppliers' royalty share increases by 37.75 percentage points to 61.19%.

26. While applying Dr. Crawford's regulated fees model to the subset of relevant CSOs provides a more reliable measure of royalty shares, the model and estimated shares continue to be flawed as they (1) remain based on regulated prices; and (2) are ultimately a volume-based measure. The regulated fees regression does not measure the relative market value of individual programming carried on the retransmitted stations, and thus it cannot provide a reliable measure of the relative market value of aggregated individual programming. That is, the model does not measure which programs, or aggregated groups of programs, are valued by the CSO and its subscribers. In contrast, the distant viewing-based methodology I proposed in my written direct testimony does.

27. Column 3 in Table 3 reports the calculated royalty shares by programming category based on the analysis described in my initial testimony. These viewing-based and modified-Crawford royalty shares are similar in that the ranking order of the top four royalty shares are the same. Remarkably, the modified-Crawford's model suggests royalty shares approximately 16 percentage points higher for Program Suppliers and approximately 14 percentage points lower for PTV over the 2010-2013 royalty years.

B. Israel's Regulated Fees Regression

1. Statistical Imprecision of Israel's Estimates

28. In his written direct testimony, SDC expert Dr. Erdem criticized Dr. Israel's regulated fees model due to the remarkable sensitivity of its regression estimates to Dr. Israel's choice of which explanatory variables to include. (Erdem WDT, pp. 14-17 and Erdem Exhibits 12-13). Dr. Erdem found that Dr. Israel's implied JSC royalty shares could range from 0% to 63.29% by changing assumptions regarding the choice of explanatory variables or the assumed functional relationship those variables have on royalty fees paid. I agree with Dr. Erdem's implication that Dr. Israel's regulated fee model is unreliable due to the statistical imprecision of his regression estimates.

29. With respect to the statistical imprecision of Dr. Israel's estimates, I have been able to replicate Dr. Israel's results exactly and calculated 95% confidence intervals

around his estimates of the value of an additional minute of programming by claimant category type. I found that Dr. Israel's estimate for the JSC category of $4.836 per additional minute, as reported in Israel Table V-2 (Israel WDT p. 20), has a 95% confidence interval of $0.0014 to $9.671. Dr. Israel's calculated values of an additional minute of programming by claimant category lead directly to his calculated royalty shares. Using the lower bound of the wide, or imprecise, 95% confidence interval results in Dr. Israel's proposed royalty share for JSC to be 0.05%. This royalty share is close to the 0% JSC royalty share Dr. Erdem found in one of his modifications of Dr. Israel's regression model (Erdem Exhibit 13, Model 1A) as well as the 0% share calculated by the modified Crawford model presented in Table 3 above.[8] The imprecision in Dr. Israel's own reported estimates underscores the lack of reliability of Dr. Israel's regulated fees model.

2. Impact of Minimum Fees Requirement on Israel Estimates

30. Dr. Israel's regulated fees regressions examined the relationship between royalty fees paid by CSOs and the minutes of programming by claimant categories carried on the retransmitted signals. As did Dr. Crawford, Dr. Israel included in his regression model other explanatory variables he believed might impact the royalty fees paid by CSOs.[9] However, while Dr. Crawford examined the relationship between the logarithm of regulated fees paid and his set of explanatory variables, Dr. Israel assumes a linear relationship. I agree with Dr. Crawford that studying the natural logarithm of royalties is based on "a more realistic economic assumption for the functional form of the relationship between minutes and royalties" (Crawford par. 114, p. 32). Specifically, examining the natural logarithm of regulated fees paid allows for a non-linear relationship with the explanatory variables used. Using the natural logarithm calculates

[8] The 0% share calculated by Dr. Erdem is due to the wide confidence interval Dr. Erdem calculated in his modified Israel regression model, Model 1A. Dr. Erdem concluded because the 95% confidence interval includes zero, we cannot reject that the relative value of JSC programming is zero.

[9] See Israel WDT, pp. 12-24 for a detailed discussion of his regression model. A list of explanatory variables in Dr. Israel's model is included in Appendix A in this testimony.

the percentage impact retransmitted minutes have on royalties. In addition to being more realistic from an economic perspective, a statistical test suggests that a non-linear, or percentage-based assumption, fits Dr. Israel's data better than does his assumed linear relationship.[10]

31. Table 4 below presents Dr. Israel's royalty shares as well as those resulting from a logarithmic transformation of regulated royalty fees, applied to the subset of CSOs where the regulated fees paid were greater than the minimum amount required by statute. The final column reports the calculated royalty shares by programming category based on the distant viewing analysis described in my initial testimony.

Table 4: Impact of accounting for minimum fees requirement on Israel royalty shares, 2010-2013[11]

Claimant Category	*(1) Israel Royalty Shares*	*(2) Israel-Modified Royalty Shares*	*(3) Distant Viewing Royalty Shares*
CCG	0.00%	4.15%	3.70%
CTV	22.16%	27.20%	13.50%
Devotionals	0.00%	0.64%	1.44%
Program Suppliers	26.82%	44.27%	45.43%
PTV	13.48%	19.55%	33.04%
JSC	37.54%	4.19%	2.89%

32. As occurred when applying Dr. Crawford's model to the subset of relevant CSOs whose retransmissions decisions impacted their costs, the most dramatic changes occur with the Program Suppliers and JSC categories. JSC's average royalty shares drops 33.35 percentage points to a 4.19% share, and Program Suppliers' royalty share increases 17.45 percentage points to 44.27%. As seen in the final column, the Israel-modified royalty shares for Program Suppliers is similar to the 45.43% average share calculated based on relative distant viewing shares.

[10] A Box-Cox functional form test suggests a log-linear model is a preferred specification over a simple linear model.

[11] Dr. Israel's regression analysis was only performed for the 2010-12 royalty years, and does not include 2013.

C. George's Regulated Fees Regression

33. Dr. George's regulated fees regression examined the relationship between royalty fees paid by CSOs and programming minutes and other explanatory variables listed in Appendix A. Her rationale for the explanatory variables in her regression fees model is to maintain "consistency and comparability with prior proceedings."[12] Dr. George restricts her regulated fees regression to the "Canadian Region" and only presents an estimate of the relative market value of programming for the CCG category. Dr. George defines the Canadian Region as the portion of the northern United States in which CSOs were permitted to retransmit Canadian signals under the compulsory licenses between 2010 and 2013.[13]

34. I have replicated Dr. George's regression results exactly. Her regression model would imply a CCG royalty share in the Canadian region of 22.05%. In her Table 1a, Dr. George reported that royalties in the Canadian Region totaled $217,015,916. Thus, according to Dr. George, the value of CCG programming in the Canadian Region equates to 22.05% * $217,015,916, or $47,852,682. Total royalties were $774,854,063 over 2010-2013. Dr. George therefore concluded that CCG retransmitted programming warrants $47,852,682/ $774,854,063, or 6.18%, of all royalties paid over 2010-2013.

35. Even though Program Suppliers and Devotional programming belong to different agreed-upon claimant categories, Dr. George combines them into a single category for her regulated fees regression analysis. Her regression found that each additional 1,000 minutes of Program Suppliers/Devotional programming on distantly retransmitted Canadian Signals was associated with a $294 reduction in royalty fees paid. Dr. George then proceeded to calculate that Program Suppliers/Devotional's royalty share from these signals in the Canadian region was *negative* 12.35% (George WDT, Table 3). When

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[12] George WDT, p. 23. She stated that she made minor adjustments to reflect changes in the cable market since the prior proceeding.

[13] As described in her written direct testimony, her definition of the Canadian Region includes areas outside the Canadian Zone where Canadian signals may be retransmitted to include CSOs that moved, at least partially, into the Canadian Zone through merger activity during 2010-2013. George WDT, p. 21.

calculating her CCG royalty share, Dr. George does not adjust her calculation to include only those categories with estimated positive marginal values of programming. That is, rather than treat Program Suppliers/Devotional programming on retransmitted Canadian signals as having no value; she calculated that such programming had *negative* value to CSOs and their subscribers. As a result, her proposed methodology suggested that the Program Suppliers and Devotional claimant categories should *make additional payments* of $26,801,466 (12.35% * $217,015,916) into the Canadian Region pool to benefit CCG.

36. Adjusting the George methodology such that the Program Suppliers and the Devotional programming on Canadian signals had zero value to CSOs, rather than penalize those copyright owners for having their programming retransmitted, would imply a 5.50% share for CCG of the overall royalty pool.

37. Aside from its suggestion that Program Suppliers and Devotional claimants contribute additional funds to the royalty pool to benefit CCG claimants, Dr. George's regulated fees regression suffers from similar flaws as do Dr. Crawford's and Dr. Israel's regulated fees regressions. Dr. George does not restrict her regression to analyze the CSO retransmission choices to those choices that were associated with incremental costs. When applying Dr. George's regulated fees model to the subset of CSOs where the regulated fees paid were greater than the minimum amount required by statute, there is not a statistically significant relationship between CCG programming minutes and royalty fees paid in the Canadian region.[14] Thus, one conclusion based on Dr. George's methodology, applied to relevant CSOs, is that CCG's royalty share in the Canadian Region, as well as the entire United States, is 0%. However, because cable subscribers viewed retransmitted CCG programming on a distant basis, I believe there is economic value to the programming. A more reasonable measure of CCG's royalty share corresponds to its programming's share of distant viewing, or 3.70%, on average over the 2010-2013 royalty years.

[14] *See* Appendix D for regression results applying Dr. George's model to the subset of CSOs paying greater than their statutorily set minimum.

D. The Issue of WGN and Non-Compensable Programming

38. As stated in my direct testimony, I excluded from my analysis of the relative market value of distantly retransmitted programming all programs that aired on WGN's local feed ("WGN") that were not simultaneously broadcast on WGN's national feed ("WGNA") because only simultaneously retransmitted programming is compensable under Section 111. I then proceeded to perform an analysis of the relative market value of each compensable program aired on retransmitted stations, then added up the values of the individual programs into the agreed upon program categories.

39. Dr. Bennett provided an example of compensable as opposed to non-compensable WGN programming. In Bennett Figure 5, reproduced below, only "WGN News at Nine" that aired on WGN and WGNA during the same time slot on January 2, 2010 is defined as compensable. Each other program in Dr. Bennett's example, all Program Suppliers programming, are defined as non-compensable under Section 111.

Bennett Figure 5. Snapshot of WGN and WGNA airings data

Time (UTC)	WGNA		WGN	
	Program title	Program runtime	Program title	Program runtime
02:00:00	Barney Miller	30 min	Smallville	60 min
02:30:00	Barney Miller	30 min		
03:00:00	WGN News at Nine	60 min	WGN News at Nine	60 min
04:00:00	Scrubs	30 min	Family Guy	30 min
04:30:00	Scrubs	30 min	Two And A Half Men	30 min

40. Dr. Bennett's example is emblematic of the overall WGN/WGNA non-compensable retransmissions issue. As shown in Table 6 below, approximately 45.9% of all retransmitted minutes from 2010-2013 were non-compensable WGN minutes (42.8% of non-compensable Program Suppliers programming and 3.1% of non-compensable the Devotionals programming). Thus, 93.3% of all retransmitted non-compensable minutes that aired on WGN belong to the Program Suppliers category.

Table 6: Number and Percentage of Retransmitted Minutes by Program Category and Whether Non-Compensable WGN Programming, 2010-2013		
Category	*Retransmitted Minutes*	*% of Total*
PS	**178,597,872**	**60.0%**
Compensable PS	*51,261,616*	*17.2%*
Non-compensable WGN, PS	*127,336,256*	*42.8%*
JSC	**6,962,722**	**2.3%**
Commercial	**19,677,607**	**6.6%**
PTV	**18,322,702**	**6.2%**
Devotional	**13,585,045**	**4.6%**
Compensable Devotional	*4,384,240*	*1.5%*
Non-compensable WGN, Devotional	*9,200,805*	*3.1%*
CCG	**4,839,825**	**1.6%**
Total	**297,631,629**	**100.0%**

41. CSOs, through their subscribers, placed value on *all* programming contained on WGN that were retransmitted – both compensable and non-compensable – insofar as the subscribers viewed the programming on a distant basis. There is no evidence that CSOs discounted the value of WGN at the time they chose to carry the signal because of non-compensable programs. Table 6 above implies that 71.3% of Program Suppliers minutes that were retransmitted (127.3 million/178.6 million) aired on WGN, and are classified as non-compensable retransmissions under Section 111. The vast majority of non-compensable Program Suppliers retransmissions occurred when WGN and WGNA each aired Program Suppliers programming, but aired different titled programs, or different episodes of the same titled program. I understand that this practice of substituting programs was followed by WGN/WGNA for approximately 20 years as part of an effort to make the signal "syndex-proof" by airing programing that would not have to be blacked out due to FCC's exclusivity rules.[15]

[15] *See* Written Direct Testimony Of Richard V. Ducey, Docket No. 2007-3 CRB CD 2004-2005, p.6 (June 1, 2009).

42. The magnitude of non-compensable WGN programming is an issue for regression models that calculate the relative market value of programming based on the royalties paid by CSOs. While 45.9% of all retransmitted minutes were non-compensable WGN programming minutes, Table 7 below reports that approximately three quarters of all regulated royalty fees paid over 2010-2013 were ascribable to WGN retransmissions.

Table 7: Royalty Fees Paid Related to WGN Retransmissions and Overall					
	2010	2011	2012	2013	Total
WGN-DT	122,887,635	131,624,142	138,360,810	146,992,072	539,864,660
All	166,417,620	178,222,399	183,586,451	189,052,747	717,279,217
WGN's % of Total	74%	74%	75%	78%	75%

43. Table 7 cannot be construed as evidence of the value of WGN. Instead, it amplifies the absurdity of trying to accord any significance to WGN based on the royalty fees it purportedly generated. Also, past decision makers have questioned reliance on the "fees-generated" calculation approach both in terms of its efficacy and competing computational approaches.[16] Nevertheless, the importance of WGN's non-compensable programming to estimating the relative market value of programming can be illustrated by a hypothetical regulated market where all retransmitted programming airing on WGN and WGNA were deemed compensable, whether simultaneously retransmitted or not. I re-estimated Dr. Israel's original model, with only one change: I included WGN non-compensable programming when calculating royalty shares. This follows the reasoning that subscribers, and therefore their CSOs, value and consume programming without regard to its compensability under Section 111. These results are reported in Column 2 of Table 8 below. For ease of reference, I report again Dr. Israel's original royalty share calculations and those from my original viewing-based analysis in the adjacent columns.

[16] *See Distribution of the 2000-2003 Cable Royalty Funds*, 75 Fed. Reg. 26798, 26802-05 (May 12, 2010); *Distribution of the 2004-2005 Cable Royalty Funds*, 75 Fed. Reg. at 57063, 57071-73 (September 17, 2015).

Table 8: Israel Royalty Shares Revisited – the Impact of Non-Compensable Programming, Using Israel's Data			
Claimant Category	*(1) Israel Royalty Shares*	*(2) Israel Royalty Shares Including N-C Minutes*	*(3) Distant Viewing Royalty Shares*
CCG	0.00%	0.00%	3.70%
CTV	22.16%	13.30%	13.50%
Devotionals	0.00%	0.00%	1.44%
Program Suppliers	26.82%	56.08%	45.43%
PTV	13.48%	8.09%	33.04%
JSC	37.54%	22.63%	2.89%
Note: percentages may not add up to 100% due to rounding.			

44. When including non-compensable retransmitted WGN programming, Dr. Israel's original regulated fees model implies that Program Suppliers' royalty share increases from 26.82% to 56.08% and JSC's royalty share decreases from 37.54% to 22.63% over 2010-2013. Thus, considering all programming distantly retransmitted by CSOs, Dr. Israel's model indicates that CSOs value Program Suppliers' programming more than any other category's programming, including JSC programming.

45. In addition to the value of both compensable and non-compensable programming to their subscribers, CSOs continued to retransmit WGN for other reasons. Namely, CSOs continued to retransmit WGN due to WGN station owner's bundling requirements, CSO legacy carriage incentives, and CSO cost considerations.[17] From 1994 through 2010, CSOs were required by WGN's owner, Tribune Media, to carry WGN if the CSOs were to carry other major in-market network affiliates also provided by Tribune Media. Due to this bundling, many CSOs carried WGN.[18] As described by Ms. Hamilton, once a CSO has carried a station for an extended period, the risk of losing subscriber constituencies disincentivizes them from dropping carriage. Ms. Hamilton refers to this a "legacy carriage" consideration.[19] The legacy carriage consideration is given additional

[17] Hamilton WDT, p. 6-8.

[18] *Ibid.*

[19] *Ibid.*

weight given the small portion of a typical CSO's overall programming budget devoted to distant signal carriage.

E. The Categorization of Retransmitted Programming

46. I understand the purpose of this proceeding is ultimately to distribute royalties that have been paid to the Copyright Office for the benefit of the copyright owners, or their representatives, of distantly retransmitted programming. My written direct testimony, as well as the written direct testimonies of the economists I respond to in this testimony, attempt to quantify the share of paid royalties that should be allocated to agreed-upon categories of compensable programming. While the category definitions have been agreed to by the parties involved, and adopted by the Judges, they are not standard categories understood by the market.[20]

47. Nonetheless, to determine category royalty shares it was necessary to assign every program carried by retransmitted signals to one of the party's categories. This task of categorization was carried out by the economics experts, or in the cases of Dr. George and Dr. Crawford, their supporting experts. Dr. George's supporting expert is Mr. Bourdeau and Dr. Crawford's supporting expert is Dr. Bennett. On average, there were over 13 million program retransmissions each year from 2010 through 2013 (Gray WDT, Table 1). Classifying the retransmissions into one of the six agreed upon claimant categories was a significant undertaking requiring reliance on third-party data describing characteristics of each broadcasted program that aired on retransmitted stations.

48. Dr. Israel and I relied upon information in Gracenote data fields, Dr. Bennett relied upon information in the FYI data fields, and Mr. Bourdeau relied upon information in the CRTC logs, to assign individual programs to one of the agreed-upon program categories.

49. An advantage of the FYI database is that Dr. Bennett could acquire information for the entire universe of all US, Canadian, and Mexican signals distantly retransmitted

[20] *See* Hamilton WDT p. 8-12.

by CSOs. Dr. Israel and I relied upon random samples stations from the Gracenote data. The Gracenote data maintain different details concerning the programs that aired every day from 2010 to 2013 than does the FYI data.

50. I compared the category classification I made in my initial testimony to Dr. Bennet's, relying upon the approximately millions of programs airing on retransmitted signals each year from 2010-2013. Our categorization algorithms assigned programs to the same claimant category for 93.5% of the broadcasts being retransmitted. For the 6.5% of programs carried on retransmitted signals where our algorithms disagreed, it is difficult to determine which categorization is correct without doing a program-by-program review.

51. To gauge whether there was any bias in my categorization algorithm, or in the Gracenote data I relied upon, I repeated my distant viewing calculations for each royalty year, but replaced my determination of each program's category with that determined by Dr. Bennett relying on the FYI data. Table 9 below presents distant viewing shares by program category and royalty year relying on my classification algorithm described in my initial testimony as well as viewing shares relying upon Dr. Bennett's program classifications.

52. The viewership shares relying upon Dr. Bennett's program classifications are similar, though modestly different from, the viewership shares I reported in the initial testimony and reproduced in Table 5 above. Program Suppliers' viewership shares are higher in each royalty year using Dr. Bennett's classifications, whereas CTV's viewership shares are higher in each royalty year adopting my original classification methodology. This is consistent with no bias in intent on the part of Dr. Bennett or me.

Table 9: Distant Viewing Shares by Royalty Year Using Original Classification and CTV/Bennett Classification			
Year	*Claimant Category*	*Original Classification Share of Distant Viewing*	*CTV/Bennett Classification Share of Distant Viewing*
2010	Canadian Claimants	1.96%	1.14%
	Commercial Television	15.83%	12.70%
	Devotionals	1.18%	1.28%
	Program Suppliers	50.94%	52.74%
	Public Television	27.96%	30.04%
	JSC	2.13%	2.09%
	Total	**100%**	**100%**
2011	Canadian Claimants	3.93%	2.77%
	Commercial Television	12.06%	8.70%
	Devotionals	2.44%	2.45%
	Program Suppliers	49.92%	53.72%
	Public Television	29.09%	29.71%
	JSC	2.57%	2.65%
	Total	**100%**	**100%**
2012	Canadian Claimants	3.58%	2.77%
	Commercial Television	15.48%	11.48%
	Devotionals	1.07%	1.17%
	Program Suppliers	36.17%	40.66%
	Public Television	41.64%	41.86%
	JSC	2.06%	2.06%
	Total	**100%**	**100%**
2013	Canadian Claimants	5.31%	3.72%
	Commercial Television	10.64%	7.95%
	Devotionals	1.09%	1.30%
	Program Suppliers	44.69%	48.59%
	Public Television	33.47%	33.46%
	JSC	4.80%	4.98%
	Total	**100%**	**100%**

IV. ADDITIONAL ARGUMENTS BY DRS. CRAWFORD AND ISRAEL

53. Again, I understand the purpose of this proceeding is ultimately to distribute royalties that have been paid to the Copyright Office for the benefit of the copyright

owners, or their representatives, of distantly retransmitted programming. As described below, Dr. Israel's analysis of large cable system's programming expenditures and Dr. Crawford's comments on the importance of programming heterogeneity are not relevant to CSO's carriage choices concerning distant signals and should not be considered in how to distribute paid royalties to copyright owners.

A. Irrelevance of Dr. Crawford's Distant Signal Heterogeneity Analysis

54. CSOs do not offer individual programs on broadcast stations they retransmit to their subscribers. Nor do CSOs offer individual broadcast stations they retransmit to their subscribers *a la carte*. Instead, as described in my initial testimony, CSOs offer bundled distant signal channels, cable channels, local broadcast channels and pay-per-view channels in different packages to existing and potential subscribers at varying prices.[21] In his written direct testimony, Dr. Crawford described the economic incentive for CSOs to bundle channels with dissimilar programming such as channels devoted to sports, news, and weather programming.[22]

55. I agree with the economic principles described by Dr. Crawford concerning CSOs' incentive to bundle together cables channels with dissimilar programming to maximize revenue in the face of heterogeneous subscriber preferences. However, in this proceeding we are not attempting to estimate the relative market value of a sports cable channel, of a news cable channel, or of a weather cable channel. We are interested in assessing the relative market value of aggregated groups of programming that aired on *broadcast stations* which were distantly retransmitted by CSOs. While the programs that aired on signals had value to subscribers in distant markets, as evidenced by their viewing, I have not seen any evidence to suggest that the type of programming on the distantly retransmitted stations is markedly different from the content currently bundled by CSOs.

56. Testimony by a former CSO executive, with responsibilities that included managing the cable system's programming budget and selecting broadcast stations for

[21] Gray WDT par. 11-12.

[22] Crawford WDT, Section II.A.2.

distant carriage, is consistent with the expectation that the heterogeneity of programming on distantly retransmitted signals is not an important factor in carriage decisions.[23] Instead, important factors include (1) what subscribers wanted to watch, as demonstrated by subscriber viewing behavior, competitor carriage, and subscriber surveys, and (2) legacy carriage.[24] Overall, CSOs' distant signal carriage decisions represent a small portion of CSOs' programming budgets.

B. Irrelevance of Dr. Israel's Cable Channel Expenditures Analysis

57. Again, CSOs bundle distant signal channels, cable channels, local broadcast channels and pay-per-view channels in different packages and offer them to existing and potential subscribers at varying prices. As described in the previous subsection, CSOs have a revenue maximizing incentive to bundle together a variety of different types of programming to attract and maintain as many subscribers, with different tastes in programming, as possible. Broadcast and cable channels face different economic incentives than do CSOs. Broadly speaking, local broadcast stations seek to package programming to attract viewers of various demographic groups to maximize advertising revenue, while minimizing their cost of acquiring the programming; basic cable channels seek to package content that is attractive to CSOs to be included in bundled offerings CSOs offer to their subscribers. In addition, broadcast stations are principally advertising revenue-supported while basic cable networks are supported by per subscriber fees paid by the CSOs. These economic incentives give rise to different cable channels offering niche programming, such as cooking channels, weather channels, news channels, and so on.

58. The economic incentives of cable networks and broadcast stations have contributed to the migration of live-team sports programming from broadcast television to cable networks including ESPN, Regional Sports Networks, TNT, TBS, and cable channels owned by sports leagues and college conferences. Due to this migration, the

[23] Hamilton WDT, p. 5-8.

[24] *Ibid,* pp. 5-6.

volume of non-network live team sports carried by distantly retransmitted signals was very small over the 2010-2013 time period.[25]

59. While CSOs may place a high value on live team sports programming carried by certain cable networks, as described by Dr. Crawford, economic principles suggest they bundle these sports-focused cable networks with other cable channels, distant signal channels, and local broadcast channels each with little or no sports programming.

60. Therefore, Dr. Israel's analysis of certain cable networks' relative expenditures on live team sports is irrelevant to this proceeding. The expenditures of cable networks such as TBS, TNT, and ESPN on live team sports programming does not provide information on CSOs' willingness to pay for the various types of programming carried by distantly retransmitted broadcast signals. To the contrary, consistent with Dr. Crawford's economic arguments, after negotiating programming deals with cable networks carrying live team sports programming, CSOs may then have a sufficient quantity of that type of programming to bundle for its current and potential subscribers. That is, live team sports programming would be less valuable to CSOs than other types of programming.

V. CSO SURVEY RESPONSES VS. ACTUAL MARKETPLACE BEHAVIOR

61. As an alternative to analyzing market choices made by subscribers, or CSOs, to quantify the relative market value of programming, JSC sponsored the Bortz Survey. A similar survey of CSOs was performed by Mr. Horowitz ("Horowitz Survey") who was retained on behalf of the Program Suppliers.

62. In his written direct testimony, Dr. Steckel described the fundamental principles of sound survey design. ("Steckel WDT"). He then proceeded to delineate how both the Bortz and Horowitz Survey methodologies violated many of these tenets. He concluded that neither survey alone provides a reasonable basis for measuring marketplace value, but the Horowitz Survey is preferred as it adjusts for some of the Bortz Survey major flaws. I agree with his conclusion.

[25] *See* Gray WDT, Table 1; Hamilton WDT, Section IV.B; and Mansell WDT, p. 33-37.

63. The methodological flaws and associated usefulness of the two surveys notwithstanding, Table 10 below presents the share distribution of how CSO survey respondents answered, on average, how they would allocate a hypothetical fixed dollar budget across specified categories.

Table 10: Horowitz and Bortz Survey Results of CSO Respondents Hypothetical Allocation of Fixed Dollar Amount Across Programming Categories< 2010-2013 Averages

Programming Type	*Horowitz Survey*	*Bortz Survey*
News & Community/Public Affairs	12.6%	20.6%
Syndicated Series	17.5%	14.7%
Movies	13.3%	16.3%
Live team professional and college sports	30.0%	38.2%
Other sports programming	8.5%	Not Asked
Devotional programming	4.7%	4.6%
Programs on PBS stations	12.9%	5.1%
Programs on Canadian stations	0.6%	0.5%

Note: Highlighted programming type fall under the Program Suppliers category.

64. As is evident in Table 10 above, a significant difference between the Horowitz and Bortz Surveys is the number of program types CSO respondents were asked to allocate a fixed dollar amount across. While the Bortz Survey includes a category for "live team professional and college sports" programming, it does not include a category for "other sports programming." Other sports programming consists of non-live team sports such as tennis and golf tournaments, automobile races including NASCAR, triathlon competitions, the Olympics, boxing, and Mixed Martial Arts (MMA). This type of sports programming, I understand, falls within the Program Suppliers category for this proceeding.

65. An analysis of the Gracenote programming data and Nielsen viewing data described in my initial testimony indicates that the Bortz Survey's omission of the other sports programming category is a substantial omission. Whereas sports programming

falling under the JSC category averaged 3,665,435 distantly retransmitted minutes per royalty year, sports programming falling under the Program Suppliers category averaged 1,451,808 distantly retransmitted minutes per royalty year.

66. The Bortz Survey asked survey respondents to allocate a fixed dollar amount across a *subset* of the type of programming that was available on signals available for retransmission. It is possible that, without the option to consider allocating any of their hypothetical resources to the other sports category, respondents conflated Program Suppliers sports programming with JSC's live team sports programming. Results from the Horowitz survey are consistent with this possibility as respondents' fixed-dollar allocation share to live team sports programming (30.0%) plus other sports programming (8.5%) was similar to respondents' only sports option allocation in the Bortz survey (38.2%).

67. A second difference between the surveys is the Horowitz Survey more precisely defines the programming at issue in this proceeding, explicitly defining the definitions of "non-network programming" and "distant broadcast stations."[26] While the Horowitz Survey questions provided examples of programming for each category (and the Bortz Survey did not), it is unclear whether the respondents understood the quantity, or quality, of programming available on signals distantly retransmitted. It is Ms. Hamilton's opinion, as someone experienced with selecting broadcast stations to distantly retransmit, that CSOs responding to the Bortz and Horowitz surveys would not be able to accurately identify JSC programming without more information concerning program quantity and the nature of the programs.[27]

68. In addition to survey respondents being asked to allocate hypothetical funds across programming type where actual program quantity and quality are unknown, Dr. Steckel noted in his written direct testimony that survey research literature has determined that the question formats of both the Bortz and Horowitz Surveys, constant sum questions, do

[26] Direct Testimony of Howard Horowitz, Appendix A, p. 24.

[27] Hamilton, p. 13.

not exhibit the "strongest predictive validities."[28] This is evident comparing the survey results to actual choices made by subscribers as well as by those CSOs who faced cost implications of which stations to distantly retransmit. Table 11 below summarizes royalty shares based on market-based analyses reported earlier to contrast them with the royalty shares implied by the Horowitz and Bortz Surveys.

Table 11: Market-Based and CSO-Survey-Based Royalty Shares

	Subscriber Choices: Viewing		*CSO Choices: Regulated Fees Analysis*		*Constant Sum Surveys*	
Claimant Category	*Gray-Initial*	*Gray-Modified*	*Crawford-Modified*	*Israel-Modified*	*Horowitz Survey*	*Bortz Survey*
CCG	3.70%	2.60%	5.468%	4.15%	0.56%	0.53%
CTV	13.50%	10.21%	13.5431%	27.20%	12.62%	20.63%
Devotionals	1.44%	1.55%	0.757%	0.64%	4.73%	4.58%
Program Suppliers	45.43%	48.93%	61.1948%	44.27%	39.29%	31.00%[18]
PTV	33.04%	30.04%	19.0618.96%	19.55%	12.86%	5.10%
JSC	2.89%	2.95%	0.00%	4.19%	29.96%	38.23%[28]

69. The market-based measures presented in Table 11 do not support the CSO survey results. The difference between the market-based royalty share measures and the survey-based measures is largest for the JSC category. This could be due to the intrinsic flaws in the survey methodologies, as delineated by Dr. Steckel's testimony, or due to both the migration of sports programming out of broadcast television and survey respondent errors, as suggested by Ms. Hamilton's testimony. The definition of JSC programming is narrower than what the cable industry considers sports programming.

70. Moreover, given the low supply of sports programming available on broadcast stations over 2010-2013, in an actual unregulated market, the CSO survey respondents would have been unlikely to devote the share of resources that they answered they might have devoted to sports programming.

71. I agree with Dr. Steckel's conclusions that the CSO surveys cannot assist the Judges in determining the relative market value of programming at issue in this

[28] Steckel WDT, p. 36.

proceeding, and, that market value is driven by consumer preferences.[29] One can ask what they want to watch or analyze what they watched. The latter is what I did in my initial testimony and the results reproduced in Table 11 above.

VI. CONCLUSION

72. As explained above, my conclusions regarding calculating the relative market value of programming described and reported in my initial testimony are unaltered by written direct testimony submitted on behalf of CCG, CTV, JSC, or the Devotionals. In my opinion, relative program viewership provides a reasonable and reliable measure of the relative economic value of distantly retransmitted programming, and should be utilized by the Judges as the basis for allocating royalties in this proceeding.

[29] Steckel WDT, pp. 7, 41.

APPENDIX A

Table A-1: Crawford Regression Replication

Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
Distant minutes Program Suppliers	0.00000208	0.00000021	10.76	0.00000170	0.00000246
Distant minutes Sports	0.00003330	0.00000382	10.27	0.00002700	0.00003970
Distant minutes CTV	0.00000445	0.00000060	8.21	0.00000339	0.00000552
Distant minutes Public	0.00000164	0.00000019	9.27	0.00000130	0.00000199
Distant minutes Devotional	0.00000089	0.00000032	2.91	0.00000029	0.00000150
Distant minutes Canadian	0.00000429	0.00000036	11.74	0.00000357	0.00000501
Permitted Stations	0.00111020	0.02415690	0.05	-0.04194280	0.04416320
Syndicated Exclusivity Surcharge	0.70434340	0.23493250	1.29	-0.36225090	1.77093800
3.75% fee	0.44616170	0.04359180	10.39	0.36197750	0.53034600
Laggged number of subscribers	0.00003720	0.00000233	27.72	0.00003460	0.00003990
Distant signals	-0.47944560	0.05048030	-10.02	-0.57323830	-0.38565280
Interaction Charter and Lagged Subs	0.00000991	0.00000681	4.58	0.00000567	0.00001410
Interaction Comcast and Lagged Subs	-0.00002780	0.00000250	-19.91	-0.00003060	-0.00002510
Interaction Time Warner and Lagged Subs	-0.00000973	0.00000291	-6.5	-0.00001270	-0.00000680
Interaction Verizon and Lagged Subs	-0.00002980	0.00000246	-19.86	-0.00003270	-0.00002680
Interaction Cox and Lagged Subs	-0.00001940	0.00000254	-9.17	-0.00002360	-0.00001530
Interaction Others and Lagged Subs	-0.00002160	0.00000295	-13.98	-0.00002460	-0.00001860
Local stations	0.04631400	0.00333920	17.72	0.04119200	0.05143600
Distant unmerged minutes	0.00000342	0.00000072	5.92	0.00000229	0.00000455
Distant minutes TBA	0.00000102	0.00000187	0.61	-0.00000227	0.00000431
Constant	6.90076700	0.07087710	121.39	6.78933800	7.01219600

Table A-2: Israel Regression Replication

Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.4693279	0.1037529	4.52	0.2659306	0.6727251
d_Sports	4.836397	2.46633	1.96	0.0014033	9.67139
d_Comm_TV	1.009978	0.3549573	2.85	0.31412	1.705837
d_Pub_Broad	0.6601077	0.3055814	2.16	0.0610461	1.259169
d_Devotional	-0.7010084	0.2459957	-2.85	-1.183258	-0.2187584
d_Canadian	-0.972506	0.2123176	-4.58	-1.388733	-0.5562787
d_Network	-0.9845382	0.2902276	-3.39	-1.5535	-0.4155761
d_other	0.9164661	0.4622938	1.98	0.0101855	1.822747
prev_soasubscribers	1.351383	0.0600544	22.5	1.233652	1.469113
prev_channelsactivated	141.8119	18.73303	7.57	105.0877	178.5361
medianincome	1.338665	0.2856631	4.69	0.7786508	1.898679
channelsbroadcast	-493.511	326.5168	-1.51	-1133.614	146.5924
rate375	41917.92	4711.349	8.9	32681.79	51154.05
minimum_pay	-16501.17	3689.076	-4.47	-23733.24	-9269.11
Per_2	-4229.919	4837.95	-0.87	-13714.26	5254.417
Per_3	-1579.701	5020.054	-0.31	-11421.01	8261.612
Per_4	-1066.388	5363.864	-0.2	-11581.71	9448.93
Per_5	7467.661	6098.045	1.22	-4486.944	19422.27
Per_6	5585.385	6437.822	0.87	-7035.319	18206.09
_cons	-102874.7	14640.35	-7.03	-131575.6	-74173.75

Table A-3: George Regression Replication					
Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
wdchours	88.87743	32.92006	2.7	24.31935	153.4355
wdjhours	906.8371	774.1472	1.17	-611.3087	2424.983
wdphours	-293.7664	121.0112	-2.43	-531.0761	-56.45678
wdncshours	44.09334	5.294496	8.33	33.71054	54.47614
lsystemsub	0.7963635	0.04409	18.06	0.7099004	0.8828265
lchannels00	95.68327	18.01655	5.31	60.3518	131.0147
cndC	-18272.75	6039.841	-3.03	-30117.22	-6428.29
cndE	-1680.662	1349.807	-1.25	-4327.709	966.3847
cndI	-33.97132	403.4433	-0.08	-825.1462	757.2036
cndL	5053.886	8107.175	0.62	-10844.74	20952.51
cndN	2930.076	900.4988	3.25	1164.148	4696.005
has375	16300.34	4571.023	3.57	7336.308	25264.37
pDSEI1	-18159.54	3989.138	-4.55	-25982.46	-10336.62
merger	-26891.4	16459.22	-1.63	-59168.84	5386.048
pop	0.0408099	0.0042719	9.55	0.0324325	0.0491873
wminc	-0.1359183	0.0691983	-1.96	-0.27162	-0.0002166
t					
2010_2	1237.733	4971.187	0.25	-8511.041	10986.51
2011_1	-1962.321	5574.24	-0.35	-12893.72	8969.076
2011_2	345.3621	5271.567	0.07	-9992.474	10683.2
2012_1	9869.039	6138.014	1.61	-2167.948	21906.03
2012_2	11550.63	5954.644	1.94	-126.7584	23228.02
2013_1	10236.02	5969.962	1.71	-1471.406	21943.45
2013_2	13137.22	6157.873	2.13	1061.284	25213.15
_cons	-57781.25	8645.677	-6.68	-74735.9	-40826.59

APPENDIX B

Table B-1: Modified Crawford Regression

Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
Distant minutes Program Suppliers	0.00000416	0.00000019	21.86	0.00000379	0.00000453
Distant minutes Sports	-0.00000006	0.00000559	-0.01	-0.00001100	0.00001090
Distant minutes CTV	0.00000272	0.00000060	4.55	0.00000155	0.00000389
Distant minutes Public	0.00000142	0.00000014	10.39	0.00000115	0.00000169
Distant minutes Devotional	0.00000103	0.00000094	1.09	-0.00000081	0.00000287
Distant minutes Canadian	0.00000433	0.00000057	7.67	0.00000322	0.00000544
Permitted Stations	-0.03602310	0.00590990	-6.1	-0.04761000	-0.02443630
Syndicated Exclusivity Surcharge	0.80433960	0.37130630	2.17	0.07635980	1.53231900
3.75% fee	1.17623900	0.04916620	23.92	1.07984500	1.27263400
Laggged number of subscribers	0.00000421	0.00000115	3.66	0.00000195	0.00000647
Distant signals	0.02821040	0.00494820	5.7	0.01850910	0.03791180
Interaction Charter and Lagged Subs	0.00000289	0.00000156	1.86	-0.00000016	0.00000594
Interaction Comcast and Lagged Subs	-0.00000201	0.00000118	-1.7	-0.00000432	0.00000031
Interaction Time Warner and Lagged Subs	-0.00000316	0.00000125	-2.53	-0.00000561	-0.00000071
Interaction Verizon and Lagged Subs	-0.00000177	0.00000141	-1.26	-0.00000452	0.00000099
Interaction Cox and Lagged Subs	0.00000618	0.00000150	4.11	0.00000323	0.00000913
Interaction Others and Lagged Subs	-0.00000126	0.00000120	-1.05	-0.00000362	0.00000110
Local stations	0.00198920	0.00038300	5.19	0.00123830	0.00274010
Distant unmerged minutes	0.00000652	0.00000131	4.99	0.00000396	0.00000908
Distant minutes TBA	0.00001210	0.00000284	4.27	0.00000656	0.00001770
Charter	0.52984310	0.13836820	3.83	0.25855960	0.80112660
Comcast	0.83404190	0.13464540	6.19	0.57005730	1.09802700
Time Warner	0.85392800	0.14971140	5.7	0.56040510	1.14745100
Verizon	3.02900200	0.40862220	7.41	2.22786100	3.83014400
Cox	0.44375200	0.18435510	2.41	0.08230700	0.80519700
Others	0.32237870	0.12264970	2.63	0.08191280	0.56284460
20102	-0.02061860	0.08184670	-0.25	-0.18108660	0.13984940
20111	-0.00774800	0.08242830	-0.09	-0.16935630	0.15386030
20112	-0.04674470	0.08435340	-0.55	-0.21212730	0.11863790
20121	0.01433080	0.08675030	0.17	-0.15575110	0.18441270
20122	-0.03113230	0.08718460	-0.36	-0.20206570	0.13980110
20131	-0.08414170	0.08777210	-0.96	-0.25622690	0.08794340

20132	-0.08975770	0.08825300	-1.02	- 0.26278590	0.08327040
Constant	5.95555600	0.14198260	41.95	5.67718600	6.23392600

APPENDIX C

Table C-1: Israel Regression - Splitting Non Compensable minutes

Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
WGN_d_Prog_Supp	0.4197273	0.1025823	4.09	0.218625	0.6208295
WGN_d_NC_Prog_Supp	0.8783349	0.5940699	1.48	-0.2862797	2.04295
d_Sports	-4.042402	3.187437	-1.27	-10.29105	2.206249
d_Comm_TV	1.808528	0.40472	4.47	1.015115	2.601941
d_Pub_Broad	0.806503	0.315594	2.56	0.1878125	1.425193
WGN_d_Devotional	-0.8812088	0.254051	-3.47	-1.37925	-0.3831672
WGN_d_NC_Devotional	1.579644	7.218488	0.22	-12.57148	15.73077
d_Canadian	-0.6314481	0.1855997	-3.4	-0.9952978	-0.2675984
d_Network	-0.9054625	0.2875236	-3.15	-1.469124	-0.3418014
d_other	1.024824	0.4690267	2.19	0.1053444	1.944304
prev_soasubscribers	1.350359	0.0599564	22.52	1.232821	1.467898
prev_channelsactivated	138.8511	18.54987	7.49	102.4859	175.2163
medianincome	1.408955	0.2902127	4.85	0.8400217	1.977888
channelsbroadcast	-483.3794	325.3904	-1.49	-1121.275	154.5159
rate375	43180.18	4791.171	9.01	33787.57	52572.79
minimum_pay	-15368.34	3657.171	-4.2	-22537.85	-8198.816
Per_2	2988.859	5128.106	0.58	-7064.28	13042
Per_3	4568.918	5571.838	0.82	-6354.112	15491.95
Per_4	2022.901	6485.275	0.31	-10690.83	14736.63
Per_5	11210.93	8052.004	1.39	-4574.221	26996.08
Per_6	12499.98	7134.948	1.75	-1487.374	26487.33
_cons	-116098.6	15595.57	-7.44	-146672.2	-85525.04

Table C-2: Israel Regression - Log Royalty Fee					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.00000744	0.00000089	8.39	0.00000570	0.00000918
d_Sports	-0.00000156	0.00001970	-0.08	-0.00004020	0.00003710
d_Comm_TV	0.00003250	0.00000401	8.11	0.00002470	0.00004040
d_Pub_Broad	-0.00000390	0.00000187	-2.09	-0.00000757	-0.00000024
d_Devotional	0.00000532	0.00000261	2.04	0.00000020	0.00001040
d_Canadian	0.00000046	0.00000160	0.29	-0.00000268	0.00000361
d_Network	-0.00002280	0.00000314	-7.26	-0.00002890	-0.00001660
d_other	0.00001060	0.00000317	3.33	0.00000435	0.00001680
prev_soasubscribers	0.00000517	0.00000027	18.90	0.00000463	0.00000570
prev_channelsactivated	0.00206130	0.00009300	22.16	0.00187900	0.00224370
medianincome	0.00000748	0.00000118	6.32	0.00000516	0.00000980
channelsbroadcast	0.00519820	0.00125000	4.16	0.00274780	0.00764870
rate375	0.40367960	0.02672630	15.10	0.35128540	0.45607370
minimum_pay	-0.06085000	0.02756950	-2.21	-0.11489730	-0.00680280
Per_2	-0.07312380	0.03699020	-1.98	-0.14563950	-0.00060820
Per_3	-0.07761480	0.03653810	-2.12	-0.14924420	-0.00598540
Per_4	-0.13065470	0.03604340	-3.62	-0.20131410	-0.05999530
Per_5	-0.10859340	0.03811660	-2.85	-0.18331730	-0.03386960
Per_6	-0.17020630	0.04011770	-4.24	-0.24885310	-0.09155950
_cons	8.80706600	0.06772000	130.05	8.67430800	8.93982400

Table C-3: Israel Regression - Royalty over minimum					
Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.3766046	0.0614288	6.13	0.2561796	0.4970295
d_Sports	-0.1629718	1.316926	-0.12	-2.744673	2.418729
d_Comm_TV	1.310296	0.2219662	5.9	0.8751532	1.745438
d_Pub_Broad	0.5170267	0.1371004	3.77	0.2482551	0.7857982
d_Devotional	-0.5187264	0.1429903	-3.63	-0.7990445	-0.2384082
d_Canadian	0.125472	0.1124229	1.12	-0.0949217	0.3458657
d_Network	-0.5917609	0.1881096	-3.15	-0.9605309	-0.2229909
d_other	0.8405723	0.2795509	3.01	0.2925407	1.388604
prev_soasubscribers	0.1322358	0.0212329	6.23	0.0906108	0.1738607
prev_channelsactivated	55.0479	7.884912	6.98	39.59032	70.50548
medianincome	0.234927	0.0833782	2.82	0.0714724	0.3983816
channelsbroadcast	-281.8809	130.3493	-2.16	-537.4176	-26.34415
rate375	36302.27	2798.74	12.97	30815.62	41788.92
minimum_pay	-12471.1	1626.929	-7.67	-15660.53	-9281.666
Per_2	618.7489	2553.365	0.24	-4386.867	5624.365
Per_3	612.886	2617.627	0.23	-4518.709	5744.481
Per_4	-2150.27	2809.418	-0.77	-7657.852	3357.311
Per_5	-484.025	3110.544	-0.16	-6581.935	5613.885
Per_6	1725.703	3242.029	0.53	-4629.969	8081.376
_cons	-32391.53	5595.567	-5.79	-43361.08	-21421.98

Table C-4: Israel Regression - Log Royalty Fee over minimum					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
d_Prog_Supp	0.00002830	0.00000185	15.29	0.00002470	0.00003190
d_Sports	0.00002730	0.00004060	0.67	-0.00005230	0.00010700
d_Comm_TV	0.00005500	0.00000712	7.72	0.00004100	0.00006900
d_Pub_Broad	0.00004100	0.00000403	10.18	0.00003310	0.00004890
d_Devotional	0.00000515	0.00000561	0.92	-0.00000584	0.00001610
d_Canadian	0.00003050	0.00000334	9.14	0.00002400	0.00003710
d_Network	0.00003390	0.00000568	5.98	0.00002280	0.00004510
d_other	0.00004180	0.00000547	7.65	0.00003110	0.00005250
prev_soasubscribers	0.00000395	0.00000030	13.42	0.00000338	0.00000453
prev_channelsactivated	0.00089540	0.00022070	4.06	0.00046270	0.00132810
medianincome	0.00000792	0.00000331	2.39	0.00000142	0.00001440
channelsbroadcast	0.00786720	0.00229840	3.42	0.00336050	0.01237380
rate375	1.55585600	0.05620620	27.68	1.44564700	1.66606500
minimum_pay	-8.35046400	0.26057170	-32.05	-8.86139400	-7.83953300
Per_2	-0.04658080	0.09813270	-0.47	-0.23899990	0.14583830
Per_3	-0.07684890	0.09425610	-0.82	-0.26166690	0.10796900
Per_4	-0.12057540	0.09693240	-1.24	-0.31064100	0.06949010
Per_5	-0.07818780	0.10016590	-0.78	-0.27459360	0.11821810
Per_6	-0.16294460	0.10451790	-1.56	-0.36788390	0.04199470
_cons	5.42709500	0.18722750	28.99	5.05997800	5.79421100

APPENDIX D

Table D-1: George Regression - Log Royalty Fee

Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
wdchours	0.00072080	0.00039920	1.81	-0.00006200	0.00150370
wdjhours	0.00775860	0.00901550	0.86	-0.00992120	0.02543850
wdphours	-0.00172590	0.00130550	-1.32	-0.00428600	0.00083430
wdncshours	0.00037720	0.00005370	7.02	0.00027180	0.00048250
lsystemsub	0.00000277	0.00000028	10.06	0.00000223	0.00000331
lchannels00	0.00188340	0.00010680	17.64	0.00167400	0.00209280
cndC	-0.11763260	0.04719470	-2.49	-0.21018400	-0.02508120
cndE	0.00171530	0.00651880	0.26	-0.01106830	0.01449900
cndI	0.01850720	0.00405710	4.56	0.01055090	0.02646340
cndL	0.00645260	0.05806780	0.11	-0.10742170	0.12032690
cndN	-0.02010550	0.00647060	-3.11	-0.03279460	-0.00741630
has375	0.28977640	0.03982520	7.28	0.21167700	0.36787590
pDSEl1	-0.23178330	0.04218760	-5.49	-0.31451570	-0.14905100
merger	0.10006510	0.08904800	1.12	-0.07456290	0.27469320
pop	0.00000024	0.00000002	13.15	0.00000020	0.00000027
wminc	-0.00000970	0.00000098	-9.86	-0.00001160	-0.00000777
t					
2010_2	-0.06147280	0.05639200	-1.09	-0.17206070	0.04911520
2011_1	-0.09970780	0.05655600	-1.76	-0.21061720	0.01120170
2011_2	-0.17029590	0.05801050	-2.94	-0.28405780	-0.05653390
2012_1	-0.17583660	0.06005430	-2.93	-0.29360650	-0.05806660
2012_2	-0.18939160	0.06173820	-3.07	-0.31046370	-0.06831960
2013_1	-0.20699240	0.06200730	-3.34	-0.32859220	-0.08539260
2013_2	-0.20117410	0.06318680	-3.18	-0.32508700	-0.07726130
_cons	9.62680500	0.06652330	144.71	9.49634900	9.75726000

Table D-2: George Regression - Log Royalty Fee, No minimum					
Log Royalty Fee	Coefficient Estimate	Standard Error	t-stat	95% Confidence Interval	
wdchours	0.00082400	0.00044360	1.86	-0.00004630	0.00169420
wdjhours	0.01381890	0.00993840	1.39	-0.00568090	0.03331860
wdphours	-0.00251750	0.00139920	-1.8	-0.00526290	0.00022780
wdncshours	0.00034650	0.00006230	5.56	0.00022430	0.00046860
lsystemsub	0.00000302	0.00000024	12.81	0.00000255	0.00000348
lchannels00	0.00161100	0.00014310	11.26	0.00133030	0.00189180
cndC	-0.23838080	0.06281370	-3.8	-0.36162560	-0.11513600
cndE	-0.00653410	0.00869570	-0.75	-0.02359560	0.01052750
cndI	0.02157170	0.00574290	3.76	0.01030380	0.03283970
cndL	-0.15438660	0.07525740	-2.05	-0.30204680	-0.00672640
cndN	-0.02296740	0.00843140	-2.72	-0.03951040	-0.00642440
has375	0.24939480	0.04751460	5.25	0.15616790	0.34262160
pDSEl1	0.00000000	(omitted)			
merger	0.05629070	0.10295120	0.55	-0.14570670	0.25828810
pop	0.00000024	0.00000003	8.33	0.00000018	0.00000030
wminc	-0.00001080	0.00000153	-7.05	-0.00001370	-0.00000776
t					
2010_2	-0.04146550	0.08028460	-0.52	-0.19898940	0.11605850
2011_1	-0.08523360	0.08129080	-1.05	-0.24473190	0.07426460
2011_2	-0.15963690	0.08092100	-1.97	-0.31840950	-0.00086430
2012_1	-0.15598980	0.08388960	-1.86	-0.32058700	0.00860740
2012_2	-0.14699000	0.08764450	-1.68	-0.31895450	0.02497450
2013_1	-0.20694630	0.08826690	-2.34	-0.38013210	-0.03376050
2013_2	-0.19288670	0.09078440	-2.12	-0.37101200	-0.01476150
_cons	9.82254300	0.09544150	102.92	9.63528100	10.00981000